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FORMERLY

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INDEX TO CONTENTS, PAGE 180 ADVERTISERS' INDEX, PAGE 18

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Gas-Fired Soda Kettles Provide Efficient Means of Cleaning Metal Parts—Tank Furnaces Have Many Uses

Operation of First Simple—Applications of Latter Include Cooking Food, Cleaning Cloth, Hair, Etc., Plating Metals and Making Feather Bone

By GILBERT C. SHADWELL

Sales Manager, Improved Appliance Company, Brooklyn, N. Y

Soda-Kettles are made, primarily, for shop use in cleaning metal parts of machinery or appliances such as fittings, nipples, chains, screws, nuts, bolts, etc. No other method is so quick or so efficient.

The operation is very simple. Sufficient water is placed in the pot and about ½ lb. of soda or about ¼ lb. of caustic potash is added for each gallon of solution required.

This solution should be heated to about 180 or 200 deg. Fahr. The parts to be cleaned are then put into the metal basket which is dipped into the solution for a few moments and then agitated until the grease or oil has been removed from them.

Such an appliance as this is invaluable whenever oil, grease or chips, etc., have to be removed either from newly-made parts before they are hardened, plated or assembled, or from parts of apparatus which are being repaired or renovated.

Parts which have been cleaned, dry very readily from their own heat when taken from the hot soda solution so that there is no danger of their rusting or being similarly damaged.

These appliances may be used to replace almost all other methods of cleaning machinery, etc. Gasolene is dangerous. A gas operated soda-kettle is always safe.

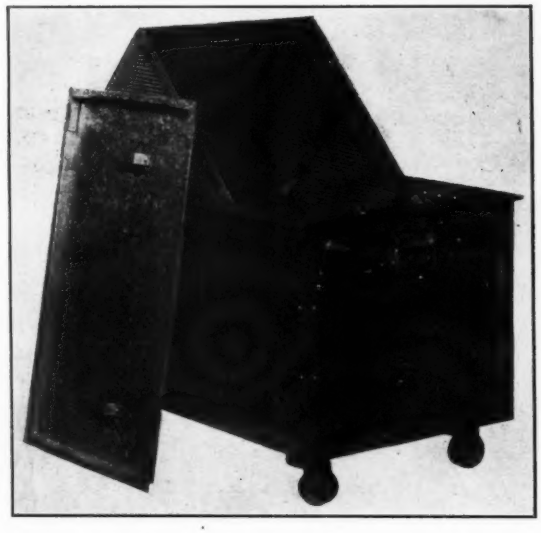

FIG. 1. WATER JACKETED OIL TEMPERING BATH

Also Used for Oil Tempering

This appliance, although commonly known as a soda-kettle, is also very largely used for oil tempering, and as such is usually termed an oil tempering furnace. In such cases, the kettle is filled with oil instead of a soda solution.

This operation is carried out as follows:

The steel parts to be treated are first hardened by heating them in an oven furnace to about 1,200 to 1,600 deg. Fahr., depending on the nature of the steel. They are then quenched in water until quite cold. The temper of the steel is then drawn by plunging the cold parts in the oil which is heated to about 400 to 600 deg. Fahr. This is done by placing the steel parts in the basket which, in turn, is placed in the oil and left there some 20 to 30 minutes, or until the parts have reached the same temperature as the oil. They are then taken out and cooled after which they will be found to have been tempered. This process has several variations but the general method is the same in all cases.

An idea as to usual sizes and capacities of such appliances is seen in the following table:

Actual Capacities (gallons).	Dimensions. Wash Basket. Top Diam.	Wash Basket. Depth.	Overall Outside. Diam.	Overall Outside. Height.	Approx. Shipping Weight (lbs.).	Max. Gas Cons. (cu. ft. per hr.)
2.....	8½"	7"	15½"	18½"	70	25
4.....	10½	8½	10	24½	110	35
9.....	15½	10	25	31	150	75
17.....	19½	11	25	31	185	90
23.....	22½	12½	28	31	210	125

These same operations may be carried out in a regular tank furnace if the tank is of extra strong construction. For these purposes the chamber should be of thick welded black sheet steel of about No. 10 gauge, as this makes them practically of one piece and of great strength and durability.

Fig. 1, is a water-jacketed oil tempering bath which is used in exactly the same manner as the description given above on soda kettles for such work. The jacket is merely provided to maintain a constant temperature of the oil which is necessitated in very accurate work.

A special soda tank is fitted with a rack. This is operated in a manner similar to the use of a regular soda kettle or soda tank and is employed for removing the ink from damaged or faultily printed decorated tin plate so that it can be cleaned and redecorated.

Such decorated tin plate has innumerable uses. The caps for beer bottles, soda bottles, etc., are all stamped from such decorated tin plate, as are tobacco cans, salad oil cans and a host of other products. In some cases a thermometer with a long stem is used to help the operator regulate the heat.

The primary uses of a tank furnace are for boiling hams, meats, etc.; for cooking vegetables, steaming clams, etc.; for boiling and cleaning cloth, hair, etc.; also for soda tanks, electrotypers' solutions, oil, tempering, etc.

Boiling Chamber Most Important Factor

The boiling chamber being the most important factor should never be made of ordinary galvanized iron, soldered, but should be first made up in black steel and then dipped in a zinc bath to insure it being perfectly galvanized, with all rivets covered and all joints closed. This effectually prevents rust and greatly prolongs the life of the appliance.

The lid should be double with insulating air space, and it should be so constructed that whenever the lid is raised the condensation which has collected on its under side is drained back into the tank, so that the top of the appliance is always clean and dry.

It is desirable that there should be a removable rack provided on the bottom of the boiling chamber to keep the materials being boiled from being scorched or burned by direct contact with the bottom sheet.

A good substantial drain cock should also be provided at the bottom by means of which the tank may be emptied; there should be no boss or shoulder on the inside to retain any liquid. Burners used in these furnaces are usually of the atmospheric type. The products of combustion should be carried up around the boiling chamber to flue outlets which may be situated along the front and back, at the top. This is desirable so as to utilize all or as much as possible of the heating effect of the gas. The burners should be equipped with adjustable gas orifices and air shutters. It may be mentioned also that such burners should be easily removable.

There should be a shield over the air-gas mixers to protect them from becoming clogged with drippings.

FIG. 2. ONE BATH IS OF HOT LYE AND ONE OF HOT WATER

This precaution will keep the burners in perfect operating condition. The furnace body should be well lined with asbestos to insulate it and protect the operator.

The matter of the construction of the tank is of maximum importance. For cooking and other work of a light nature a tank should be of about No. 18 gauge steel, which is seamed, and then dip-galvanized to close the seams. Soldered tanks are practically worthless.

Care Needed in Selecting Type Suited to Needs

For heavier work the tank should be thicker. Such work as oil-tempering demands a black sheet steel tank which is welded. As stated above, No. 10 gauge is a good size for such "heavy" tanks and withstands rough usage. Tanks made of this thickness of steel are often supplied dip galvanized also. This makes a valuable appliance for meat cooking, boiling cloth, etc., and for use where any liquids have to be heated and where extra strength is required.

The uses are so great that care should be taken to select the style suited to the needs of a customer.

A common use for tank furnaces is that of platers' tanks. This work can be carried out in No. 10 gauge, black welded steel tanks or cast iron may be used, although it is not so good. An illustration will be of interest to describe the process involved.

Fig. 2 shows two baths. One tank has in it hot lye and the other has hot water. Before plating, the parts are dipped in the lye bath to clean them thoroughly, and from there they are taken out and dipped in the water bath to wash off the lye. The parts then dry by their own heat as in the case of a soda kettle. After the parts have been plated they are again washed in hot water and are dried in an appliance known as a sawdust box. Sometimes a wooden sawdust dryer is used without heat.

A complete platers' outfit installation covers the manufacture of such popular articles as campaign badges, buttons, advertising and other novelties, cheap jewelry, etc.

After the material has been plated and washed as described above they are dried in the sawdust box, and then lacquered. After this they are placed in the oven at the far end where the lacquer is dried. From this oven the articles are taken to the packing room for packing and shipment.

Fig. 3 shows an installation for plating the better class of jewelry and plate. Buffing machines are shown in the centre of the room. The lye and water tanks being located around the room. Dipping is also very conveniently carried out in regular cauldron furnaces, as can be seen from Fig. 4.

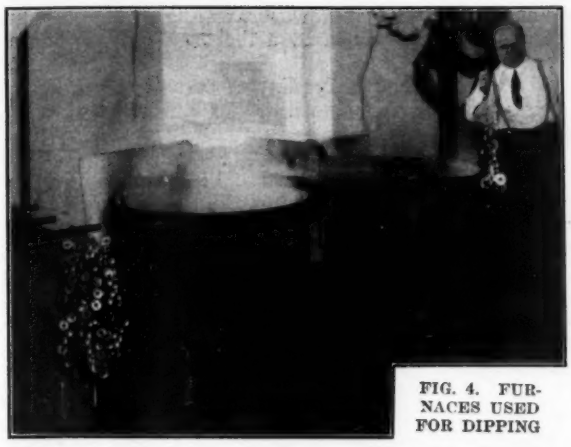

FIG. 4. FURNACES USED FOR DIPPING

Fig. 5 shows a type of sawdust drying box. This one is water jacketed for safety and for maintaining a proper temperature. It is used for drying small parts of plated ware and jewelry.

To give an idea of how wide is the use of the tank furnace in modified form, the manufacture of feather bone may be cited. The process in making this product is as follows:

Feather bone consists of the quills of feathers cut into small strips about $\frac{1}{32}$ in. in diameter which are laid in a continuous string and interwoven with thread. This is then run into the glue tank, after which wringers are provided to remove the superfluous glue. The material is afterwards put into a dry box.

It has to make several passes through the dry box and then is ironed to the particular size and shape required. This dry box is connected to an air heater which dries the material before being ironed.

Fig. 6 shows a special tank furnace for use in oiling leather belts for treating and preserving them. After the oil has been heated, the belting is run in through the rollers at the left end, and it is passed out through the wringer at the right end, which removes the surplus oil. The tank furnace is water-jacketed so as to maintain an even temperature.

Fig. 7 is a modified tank furnace used for sterilizing bottled beer. The tank contains water and the cases of bottled beer are placed in it. The water is then heated up to 180-200 deg. Fahr. for a couple of hours with the result that the beer becomes sterilized, and as a result its keeping quality is increased to many months, whereas any bottled beer not treated in this way would soon become undrinkable after a few days unless kept in a cold place.

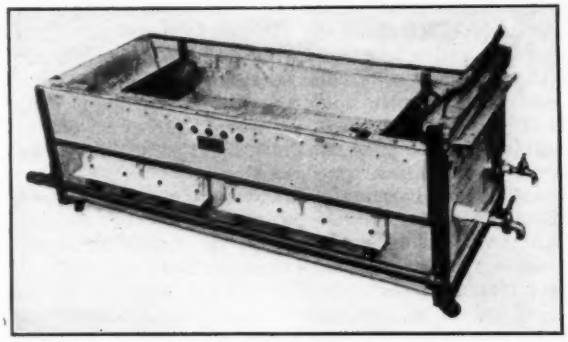

FIG. 1. SPECIAL TANK FOR OILING LEATHER BELTS

Fig. 8 illustrates a dye bath furnace. The tank is filled with glycerine and the small pots containing dye samples are placed in the rack and heated to a given temperature for testing purposes. This type has given particular satisfaction.

FIG. 3. INSTALLATION USED FOR PLATING BETTER CLASS OF JEWELRY

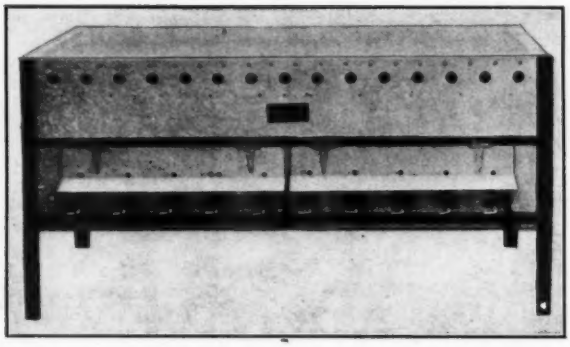

FIG. 2. MODIFIED TANK FOR STERILIZING BOTTLED BEER

A somewhat unusual modification of the tank furnace is a direct-heated furnace of special design for testing cement blocks. These blocks are placed on a screen which rests inside the tank, and steam is generated in the boiling chamber below. The effect of the steam is found to have the same effect as ageing of the cement under natural conditions.

Another modification of the regular tank furnace consists of a water-jacketed tank used for melting paraffin wax. This design and type is also employed for sealing packages of music rolls such as are used for player pianos.

This precaution is taken owing to the serious effect that dampness or moisture has in swelling or expanding the rolls. The punched holes must conform to the holes on the tracker board of the player, but they will not do so if the paper has expanded along its width. Also if the paper has expanded along its length the "tempo" will not be correct.

Such a furnace can be used for sealing packages of any similar products likely to be affected by dampness.

There is also a tank furnace for treating false teeth. These are heated in moulds so as to form the rubber previous to vulcanizing.

Special forms of tank furnaces for melting saltpetre (for metal coloring), for chemical manufacture and for the thousand and one other uses met with have not been mentioned. The applications are almost limitless.

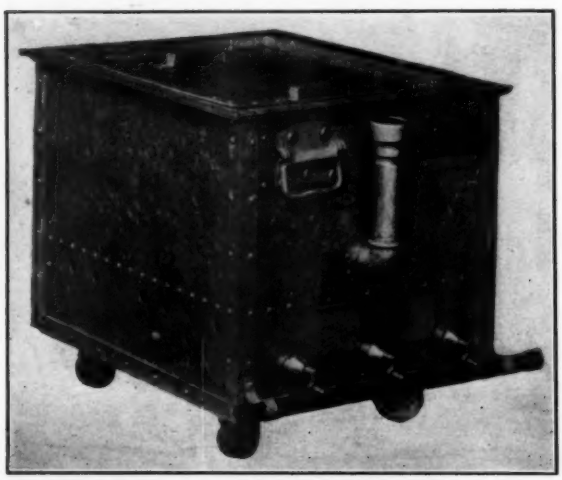

FIG. 5. SAWDUST DRYING BOX USED FOR PLATED WARE

What has been given, however, will be a guide to what results can be obtained by a thorough canvass of any territory.

To the novice, the diversity of uses for the different forms of tank furnaces must be almost bewildering, but it need not be so if thought and judgment be given to each case as it comes up.

The main point is that care be taken to give the customer what is best suited to his needs. For instance, if it is a matter of dressing poultry or the cooking of small quantities of meats, a tank furnace with a light galvanized boiling chamber will probably best suit the needs.

If, however, it is a packer or wholesaler doing considerable work he should have a medium or heavy welded galvanized tank.

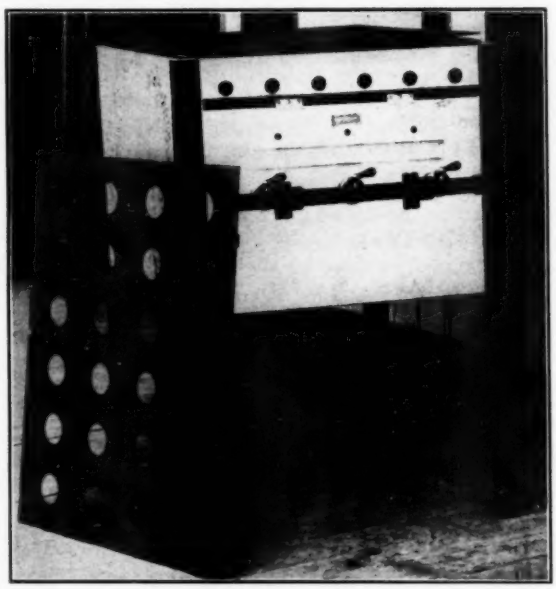

FIG. 8. DYE BATH FURNACE SHOWING RACK WHICH HOLDS DYE POTS

If, on the other hand, the work is that of oil tempering, etc., in small quantities of light weight, a medium weight tank may be permissible, but for heavy parts a heavy gauge of steel is not only necessary, but is desirable from the standpoint of durability.

A lid is almost always necessary. For some operations, however, such as a soda tank, it would be in the way, but if used for meat cooking, etc., a lid is a necessary adjunct.

A lid should preferably be used with a tank furnace when oil tempering is carried out because should the oil catch fire the lid may be closed down and the fire thus extinguished.

Then again for wax melting, etc., a water jacketed furnace is necessary, so as not to overheat the material.

These are all merely hints to show that, after all, it is merely a matter of common sense when marketing these and similar appliances.

With the outline given above, it is hoped that some of this wide and growing business may be sought out, as it can only bring credit and satisfaction to the gas company obtaining the installations.

Far Easier to Protect Lighting Business than to Regain It

J. C. D. Clark Declares that We Must Take Charge of the Customers' Fixtures and Burners and See that 100 Per Cent. Efficiency Is Produced by the Latter, and the Expense Must Be Included in the Price of the Product Served

The Bureau of Standards has told us we can produce a given amount of light for 60 per cent. less than our competitor, but it does not follow that the customer's bill for light is 60 per cent. higher than when he used gas. He may obtain less light for his money, but it serves his purpose, asserted J. C. D. Clark, of Boston in his paper on "Gas for Lighting" at the annual meeting of the New England Association of Gas Engineers, held this week in Boston. The following has been abstracted from Mr. Clark's paper.

Something Wrong Either with Our Method of Selling or Customers' Method of Utilization

It must be borne in mind that the product we sell to our customers must be treated at the burner before it can serve any useful purpose; first, by mixing it with air; second, by application of the mixture to the mantle.

The customer has struggled with this proposition for a long time, but now he sees there is a way to obtain light without this feature. He has had his experience in adjusting lights, and profits by it in using lights that require no adjusting.

W. R. Addicks in an editorial printed in the *Gas Institute News* of August, 1916, says he is convinced that much of the loss of lighting business is, aside from competition, due to three causes: First, to inequalities in the product served; second, to the absence of perfectly satisfactory mantle equipment for general service purposes; third, to an inadequate method of maintaining the mantle equipment at proper efficiency at satisfactory cost.

To this might be added the practice of serving mixed gas to cover peak load periods. These are a few of the conditions the customer has contended with while using our product.

Now that the customer can be served by our competitors without any of these troubles, it is reasonable to expect him to accept their service. It is the customers that change to your competitor's product that creates the demand for his goods. If we are unable to hold our present customers, we can not expect to attract new ones. A few years ago there was an insistent demand for gas for lighting. All buildings were equipped with piping and fixtures. This work was done by trades people engaged in building operations. To-day this demand does not exist. The percentage of new buildings that are equipped so gas can be used for light is very small. The net result is, we are losing our present customers and the field in which to obtain new customers is restricted.

These conditions exist in a general way throughout the country, in spite of the fact that gas for lighting is reliable, safe, hygienic, restful, has daylight color, diffusive quality, convenient and economical.

If the product we serve has these good qualities, then there must be something wrong with our method of selling or the customer's method of utilization. The price we ask for gas is reasonable, so the trouble must lie in the utilization of our product, and if the customer does not obtain efficiency at the burner, then no longer should we sell gas at the meter only.

We must take charge of the customers' fixtures and burners, and see to it that 100 per cent. efficiency is produced by all burners used, and the expense must be included in the price of the product served.

Experience Shows When Maintenance Service Is Optional with Customers It Does Not Produce Desired Results

In every line of business it becomes necessary from time to time, to adopt new ways, methods or policies to meet the changes in the demands of trade, and to keep pace with aggressive and wideawake competitors. The gas business is no exception. Your competitor to-day sells his product by meter measurement and furnishes lamps and renewals included in the price of the product.

What can we do to offer a better service than our competitor? We should serve our customers with a gas of uniform quality at a constant pressure—a New York company has a testing station in each square mile of territory served—we should exercise a supervision over our customers' systems of piping to see that they are not damaged when alterations are made in the building. If anyone digs a hole in the street near our mains or services, we watch them to see they do not injure our property. It is of equal importance for us to see that the customers' piping is not damaged. We should do all necessary greasing of fixture keys, repair all leaks between the fixture keys and the burners that can be done without supplying new parts. We should supply new mantles to replace defective ones.

These things you must do if you expect to meet your competitor on an equal footing. We should do them more capably and at less expense than the ever present competitor can do it.

This competition forces two things: Operation at the lowest profit, and giving the utmost in service.

If profits were excessive, concerns able to operate at lower cost would quickly capture trade, and if service were inadequate, those with better service would win. Any pre-eminence you may expect to attain must be won on a straight basis of that highest of all ideals—*Service.*

A service such as I have outlined would do three things: Enable us to *hold present customers, attract new customers,* and *create a demand for gas for lighting.*

This association discussed free mantles at its 1915 and 1916 conventions and the record of these proceedings shows that it was the sense of those present that it was the right thing to do. It was also brought out that four different maintenance plans had been tried (all of which were optional with the customer). The results reported show that when maintenance service is optional with the customer it does not produce the desired results.

One Mantle Furnished for Every 3,000 Cu. Ft. of Gas Consumed

The *American Gas Light Journal,* now The American Gas Engineering Journal in its issue of Sept. 11, 1916, printed an editorial "Free Maintenance of Gas Fixtures." I quote from this article:

"In a paper presented at a recent association meeting, a speaker suggested free maintenance of gas lighting fixtures as a means of competing with electricity in the lighting field. This journal understands that the suggestion gave rise to considerable adverse criticism. This does not seem quite called for. It resembles in a way the, fortunately, bygone antagonism of some gas companies to the gas-saving mantle lamp. Such a service would be in true accord with modern efficient business methods, which do not stop at a sale, but regard it as but a step in popularizing a certain product, and in promoting future sales.

The advantages of free maintenance are many. In the first place it takes the care of the fixture out of the hands of the layman, who knows practically nothing of its design or construction, and who has no great reason for having an interest in its successful performance, and places it in the hands of a skilled mechanic. From the standpoint of publicity alone this is an advantage of vast importance to the gas company.

"The objection may be advanced that most gas companies are selling their product at a certain set figure, and that they would not be permitted to raise that figure were they to include the maintenance of fixtures; that is, that the service would mean additional cost without a compensating remuneration. The rates in operation with most companies whose charges have been fixed by some commission are based upon a certain return on an investment of so much money.

"Sooner or later there is going to come a new rate reduction clamor, and the rates are going down again. Such is the premium that is generally placed upon efficient management. If, in the meantime, a maintenance service had been introduced, the cost of that service would be included in the cost estimate preparatory to the rate adjustment. Thus the increased cost without remunerating compensation to the companies would be but temporary. The advantages gained by it would endure for all time. Gas would deprive its most formidable competitor of the greatest of all advantages it possesses over it under present-day conditions."

I quote from an article that appears in the *Utilities Magazine* of November, 1916:

"The campaign for a change in the standard of gas quality is being developed. If the companies can be permitted to reduce the heat units they are now furnishing, will they furnish and care for mantles, which will become necessary on at least one flat flame burner in each living room?

"With respect to the furnishing and care of mantles, the gas companies appear as yet to be far behind the electric light companies, which in some large cities furnish and maintain lamps. Many homes exclusively depend on flat flame burners for their light, or use such burners in so many rooms outside of possibly one or two as to make it necessary for gas companies to emulate in large degree the examples of some electric light companies before they are permitted to reduce gas below 14 or 16 c.p. when measured in the flat flame burners in common use.

"Some protection should, of course, be granted the gas companies to prevent abuse by the consumer. In an important New Zealand city, where gas mantles and their attachments have for years been furnished, and maintained free of charge by the gas company, only one mantle is furnished free to every 3,000 ft. of gas consumed, and even less than that number are often needed."

These articles show the attitude of our trade press on this subject. In your past discussions the matter of expense has been gone into very carefully and no doubt a number of companies have operated test stations and can give you reliable data as to costs.

Advocates Giving the Service Now

Discrimination has been mentioned in your past discussions of this subject. Discrimination as applied to public utilities I take it to mean "arbitrary imposition of unequal tariffs for substantially the same service." If this meaning may be applied, I am sure you should not be accused of discrimination. In any event, you would be doing more real good for your customers by this service than by any rule or regulation that has been put in force in the past. Even price reductions do not tend to improve service. For in what way does the customer profit if you serve him with good gas at a low price, if he is unable to utilize it only by an added expense for mantles and a lot of trouble treating the gas served before he can obtain light.

Knowing the conditions as we do, would it not be better for us to give this service *now?* I believe it is the right thing to do. I believe that you believe it is the right thing to do. If so, let us do it, and thus show the basic good faith of gas companies to customers.

Provide Under-Water Storage to Avert Spontaneous Combustion in Coal

Will Have Capacity of 100,000 Tons—Duquesne Lighting Company Lost Hundreds of Tons of Coal in Fire from Such Cause Last Year

Prompted by the loss of hundreds of tons of its coal in a fire last year, the Duquesne Lighting Company of Pittsburgh has undertaken and almost completed a huge concrete basin for storing 100,000 tons of coal under water.

The basin is about 25.5 ft. deep by 791 ft. long by 153 ft. wide, and is made of 40 by 50-ft. reinforced concrete slabs laid so as to permit expansion and contraction. The inside walls have a 1:1 slope, while the outside embankments have a 2:1 incline. A rip-rap wall of double stone is provided over this embankment to prevent erosion during high water. Cranes will be provided for handling the coal.

Since the basin has so much displacement automatic valves have been provided to flood the reservoir in case of high water so it will not float. This was done by equipping the discharge system with check valves which permit water to rise inside the pit as the river elevation rises during flood season. The discharge system which consists of four 18-in. pipe lines are located as shown in the accompanying diagram. Across the bottom and sides of the pit every 51.5 ft. longitudinally and lengthwise of the bottom 41 ft. apart are expansion joints. These are made waterproof with pitch and tar paper and are supported on 12-in. concrete bases.

Water for submerging the coal is pumped into the reservoir through a 14-in. cast-iron pipe leading from the power house to four 12-in. cast-iron outlet pipes placed 160 ft. apart in plan and about 6 ft. below the top of the reservoir. The 6-ft. concrete overflow pipe shown on the plan is not connected in any way with the water system of the coal storage tank, but was already in place when the construction of the reservoir was started. The special covering shown had to be provided to protect it from mechanical injury.

Multiplicity of Appraisals a Heavy Burden in Present-Day Regulation

C. Francis Harding Declares Failure of Commission Regulation to Cure All Ills of Utilities Due in Part to an Attempt in Many Instances to Apply Theoretical Rules Without Regard to Local Environment and Status of Balance Sheet

Regulation of public service is generally considered a creature of recent birth. As a matter of fact it is a relic of medieval times, declared C. Francis Harding, professor of electrical engineering at Purdue University, in his paper on "The Evolution of Public Utility Regulation," presented at the recent annual convention of the Indiana Engineering Society. The common law in those days regulated the public servant with an iron hand. Furthermore, such service was not confined to the supply of water and light, but included the tailor, victualer and the operators of ferries, toll bridges, etc. This strict control of utilities resulted from the rental system in vogue in those early days when capital was supplied by the landlords who were able to exert great pressure upon their less fortunate plebeian tenants.

Free Competition Feature of Early Nineteenth Century

Early in the nineteenth century, however, corporations began to appear in the control of public services and free competition was the rule between rival organizations. At first the charters of such corporations were very rigidly drawn, so as to protect the public in every possible detail. Later, as a result of competition, more freedom of action was gradually given the public service corporation until it could be rightfully said that a truly "laissez faire" policy was rampant.

Such free and easy legislation led to a monopoly by those corporations whose officials had the foresight to obtain control of water rights, natural gas fields, coal mines, etc. The weaker corporations failed or were absorbed by the powerful organizations and the public for self protection, was forced to require more rigid charters for the public service corporation and to define more clearly its duties.

It is a rather strange fact that just as every individual must experience certain sensations for himself before he can be convinced that they exist, so the public mind must seemingly undergo similar experiences in a rather irregular cycle from generation to generation. The public mind of to-day, for example, has been obliged to learn all over again the difference between private and public service corporations. Before America was colonized our forefathers realized full well the difference between the public servant and the shop keeper who held no monopoly upon the necessities of life. In those days the scarcity of certain utilities and the limited number of experts in many walks of life resulted in a much broader classification of public servants than at present.

With the colonists in Massachusetts leading a pioneer life among many privations and hardships, the common law which they brought over from England was administered with still more severity. In Plymouth colony in 1668 the prices of boards, corn, bread, beef and even beer and tobacco were regulated by law and their sale treated as a public service bordering upon monopoly. In those days it would not have been difficult to have cornered the market for nearly all necessities if no legal regulation had been provided.

With these facts in mind it is difficult to understand the slow realization of the need of regulation of the comparatively few public utilities, which exist at present largely as a result of the monopoly which they hold upon the necessities of life, such as water supply, natural gas, railroad rights of way, franchise, etc.

Many people are not yet convinced of the advantage of regulated monopolies over competitive utilities in the few instances in which competition is possible in the public service field.

It is of course true that monopolies enjoyed shall I say, by electric light, power and gas corporations exist at present more because of their control of large distributing systems which are expensive to duplicate, rather than by reason of any corner which they might have upon the generation of electricity or the manufacture of artificial gas.

Yet in the long run, the consumer pays for such duplication of plant where competition continues.

This may result in quite as unsatisfactory a condition as with a poorly regulated monopoly, not to mention its inferiority when compared with the service and rates enjoyed by the consumer under well directed commission regulation.

But many feel that the pendulum has reached the end of its swing in the direction of too strict regulation. Shall we look for another cycle of "History repeating itself" during the next generation? If such a change does take place in the direction of less stringent regulation of our utilities, as was the case in the early days of the nineteenth century, it will probably result directly from the following causes:

Causes of Possible Less Stringent Regulation

Demands from consumers and regulating bodies for better and more varied service at existing rates.

Inability of utilities to meet these demands with a fair profit under strict regulation.

Dissatisfaction with commission regulation for the reason that too much was expected of it by the public.

Dissatisfaction with commission regulation for the reason that such regulating bodies are too often made up of men not experienced in the engineering and financial problems of the utility.

Difficulty in obtaining desired results through regulation because of an attempt to apply radical though theoretically correct methods to utility management in the immediate future.

That the demands for consumers for better and more varied service from public utilities at existing rates have been most urgent during the last decade will not be questioned. The public does not wish more light alone, but more light with the same monthly bill.

It has been a difficult problem for utilities, particularly in small communities, to show a creditable balance sheet at the end of the year. It must be remembered that the cost of energy is but a small percentage of the gross cost of delivering good service at the consumer's residence. Furthermore, many of the small utilities have given little or no attention to depreciation reserves until forced to do so by a commission.

Capital has been increased to meet demands for equipment replacements with little or no limitation. Elaborate accounting systems have been avoided in the attempt to reduce expenses.

Now enters strict commission regulation upon such a setting as has been described. Innovations, however desirable in the ultimate regulation, may not be introduced too rapidly.

It is the belief of the speaker that many admirable requirements for utilities have been cast into disrepute by both officials and consumers as a result of too hasty enforcement.

The practice of making a capital charge for replacements instead of setting aside a depreciation sinking fund over a period of years to take care of the replacement when it becomes necessary has been considered legitimate finance for years. It is too much to expect a corporation to adjust itself to the new restrictions immediately, particularly when a reserve fund is opened and capital increase curtailed just previous to the necessary replacement of some large unit of generating equipment.

Finance not only authorized, but generally approved to-day may not be stamped as a crime to-morrow without an intervening period in which the utility may regain its poise and adjust itself to the proposed conditions.

In a word, the public and many of the commissions have expected this new physician to effect an immediate cure for a chronic malady. A delay in such a cure need not and should not result in too hasty condemnation of both physician and method of treatment.

Type of Men Constituting Commissions

It is not to be inferred that the physician of the analogue is always the proper specialist to treat the disease in question. More than one profession is necessary to effect the cure of this patient, but all the specialists with the necessary training are too seldom summoned for the final consultation.

I refer of course, to the domination of public utility commissions by lawyers and politicians to the exclusion of engineers.

The problem, if it is to be satisfactorily solved, should have the combined talent of the legal and engineering profession.

If regulation of public service by commission has not proven at once to be a panacea for all ills to which the public utility is heir, it may also be attributed in part to an attempt in many instances to apply certain theoretical rules and methods to all problems of regulation, large and small, regardless of local environment and the status of the balance sheet.

I refer to the tendency of loading the books of utilities with expensive detailed appraisals before a slight change of rates or a bond issue can be effected.

Appraisals seem to be infectious and the contagion spreads rapidly. One made by the commission begets one by the utility. The interests of the municipality must be protected by a third.

In many instances a fourth or fifth must be undertaken by unbiased parties to check those preceding.

When all is done in great detail with a high degree of accuracy, the intangible values must be estimated as a result of experience and sound engineering judgment exercised by experts.

These added values may justly represent a considerable percentage of the detailed appraisal. They involve the "art" as well as the science of the profession and yet the engineers are criticized when their opinions differ and their conclusions cannot be given to the third decimal place.

Putting Dependence on Judgment of Engineers

I do not wish to be quoted as opposed to appraisals. I consider them necessary in many rate decisions. They must be interpreted and amplified however by experts in any event. Let us not shoulder the interested parties with such expensive detailed studies. The public must pay the cost in the long run.

Engineers will be called upon both sides of the case. Why not put some dependence upon their judgment and trust to the hearing to bring out the fair adjustment?

The Massachusetts commission began its period of education way back in the eighties. It has taken over a score of years in many instances to bring about the theoretical ideal in regulation without hardship to consumer or stockholder.

If therefore, there seems to be a state of unrest at present in the evolution of public utility regulation, let us not jump too quickly to the conclusion that the pendulum must necessarily swing again to the other extreme, but let us be sufficiently conservative in our analysis of the problem. It has been said that "A new broom sweeps clean." Possibly it may wear itself out in the process, and the floor as well, but it must be remembered that no broom at all leaves one in a much more deplorable confusion and chaos.

I believe that properly regulated monopoly has come to stay for our public utilities as a happy means between cut-throat competition with duplicate systems, for which the consumer has to pay in the long run, and governmental ownership which is bound to be inefficient, generally speaking, because of its dependence upon political prestige. Whether this feeling be general or not, let us at least give regulation a reasonable time in which to put its principles into practice to best advantage. Engineers have a real part to play in the success or failure of either solution of this very vital problem.

Cost of House Heating by Gas

For those who are laboring under the impression that house heating by gas is business that can only be secured when rates are very greatly reduced there is food for thought in the fact that in Providence, R. I., there are several house heating installations buying gas at 85 cents per thousand cubic feet. Some of the installations are located where heat is required only a few days during each week. Other installations are for the purpose of heating dwellings. The Providence Gas Company serves a city where coal can be brought in either by water or rail. The price of coal, therefore, is as low if not lower than in most eastern cities not so favorably situated.

It may be interesting to examine the figures on one house heating installation. This house is a ten room cottage. At the time these figures were compiled there was sickness in the family and it was necessary to keep the house warm. The heating units consisted of 11 General Fire Extinguisher Rector Radiators. The gas consumption for the winter was $146.29 as against 10 tons of coal the previous winter at $7.50 per ton.

The gas consumption by the month was as follows:

	Cu. Ft.
November	6,400
December	20,100
January	35,300
February	32,700
March	32,000
April	29,800
May	11,000
June	3,700

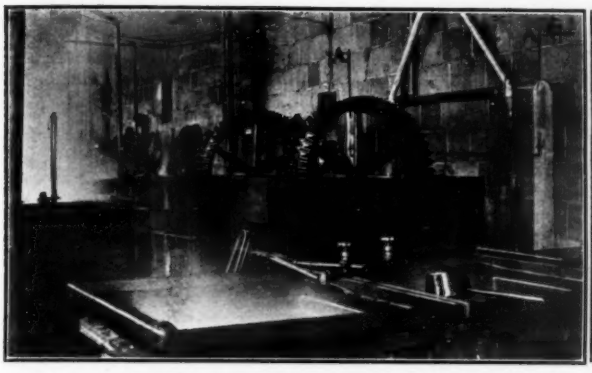

FIG. 1. TEMPERING FURNACES, SHOWING AUTOMATIC DIPPERS

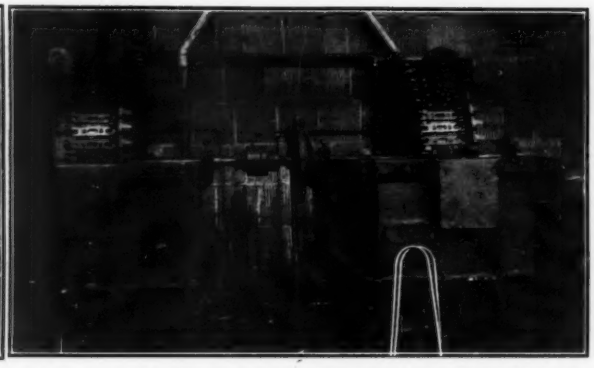

FIG. 2. SHOWING CAST IRON WHEELS WITH HOLDERS BOLTED TO RIM

160 Cu. Ft. of 580 B.t.u. Gas Per Hour Required for Oil Tempering Furnace for Rifle Bodies

Units Dipped by Revolving Cast-Iron Wheels—One Man Places and Removes All That Can Be Handled by Two Furnaces—Gas Replaces Oil-Fired Installation

By WILLIAM J. HARRIS, Jr.

Engineering Department, Surface Combustion Company, Long Island City, N. Y.

An interesting installation has recently been made for tempering rifle bodies at the plant of the Remington Arms Company, at Eddystone, Pa.

The "rifle body" referred to is part of a military type of rifle, and is the steel frame which contains the lock of mechanism and into which the barrel is screwed. It is about 8 in. long and weighs about 1½ lbs. All machine operations have been performed on it and both ends have been hardened in a cyanide bath for a length of about 2 in.

Bodies Immersed for Nine Minutes

The tempering operation is for the purpose of "drawing" the hardened end portions so that they will not be too brittle. This is accomplished by immersing the entire body in an oil bath for nine minutes at a temperature of 450 deg. Fahr. Ordinary oil-fired oil baths into which the bodies were dipped by hand in wire baskets were formerly used. Because of the large number of bodies to be treated, and the desirability of uniform results, it was decided that some form of automatic dipping device would be more satisfactory in every way.

Referring to the accompanying illustrations (Figs. 1 and 2), two identical furnaces were installed. The large cast iron wheels are 42 in. in diameter and each has 52 "holders" bolted to its rim.

Each holder is designed to take one body which is firmly held in place by a spring latch. The latter is released by hand for removal of the treated body.

The wheels dip into rectangular welded steel oil tanks which are heated by surface combustion burners below. This construction is shown in Fig. 3.

Both Wheels Driven by a Single Motor

Both wheels are driven by a single 2 h.p. electric

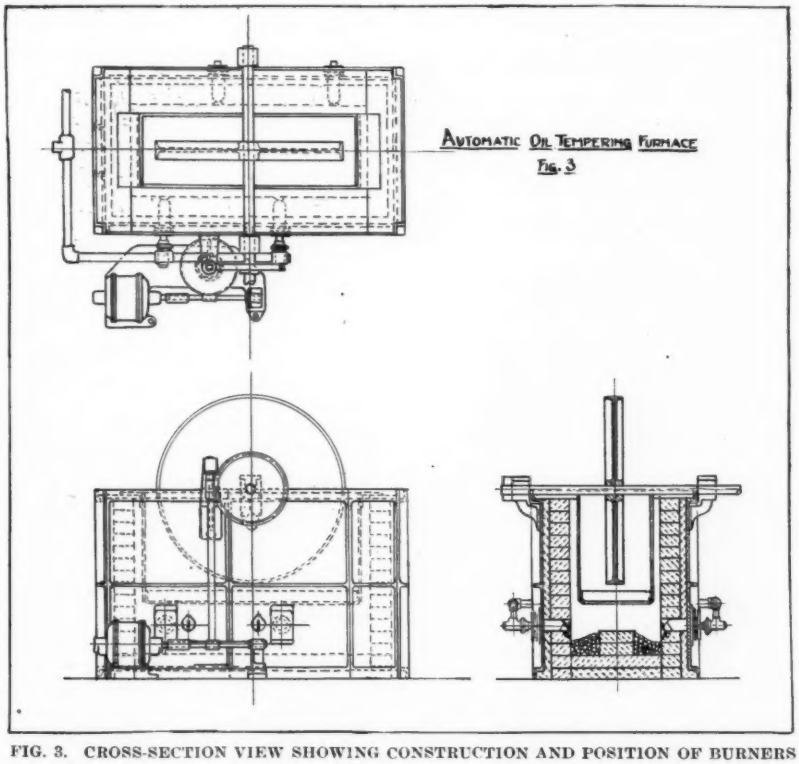

FIG. 3. CROSS-SECTION VIEW SHOWING CONSTRUCTION AND POSITION OF BURNERS

motor through a double reduction worm-drive; the motor and gearing being located between the furnaces.

The wheels make one revolution every twenty minutes, and the oil level is maintained at such a point that the bodies are immersed approximately nine minutes.

This gives a capacity of 312 bodies per hour for both furnaces, or 3120 per ten-hour day.

One man is easily able to remove the treated bodies from the holders and insert fresh ones on both wheels.

The burner equipment is The Surface Combustion Company's standard low pressure type, which operates on air at about one pound pressure and gas at about three inches of water. Attention is called to the "U" gauges fastened to the wall and marked "A" in Fig. 1. These are connected to the burner manifolds of the respective furnaces, and indicate the pressure of the gas and air mixture in inches of water.

As in all of the appliances of this system the proportion of gas and air, in the mixture are automatically maintained at the correct theoretical ratio, hence the pressure of the mixture is a direct indication of the rate at which the gas is being burned.

After the mixture pressure is once determined for a given temperature of the oil bath this affords a very accurate means of regulating the temperature, and of duplicating the burner adjustment at any time without regard to variations in air or gas pressure.

It was found on these furnaces that mixture pressure of three inches of water would just hold the desired temperature of 450 deg. Fahr. This required a gas consumption of about 160 cu. ft. of 580 B.t.u. gas per hour for each furnace.

The furnaces were designed and installed complete by The Surface Combustion Company of New York City.

30,000 or More Fires a Year Caused by Small Electrical Devices

A new form of fire peril is coming into prominence as a cause of much destruction, and its fires are so directly associated with carelessness that it has been deemed necessary to issue a special warning to the people of the United States. Because of their convenience, small electric devices, such as pressing irons, curling irons, toasters, electric pads or blankets, electric plate warmers, and electric sterilizers or heaters are now to be found in almost every community. If these were used with proper care the danger would be negligible, but, unfortunately, a proportion of their users does not realize the peril of leaving them in circuit when not in use. In such cases these devices tend to become overheated, whereupon they are likely to set fire to anything combustible with which they are in contact.

Most of these fires are small, but the aggregate loss is large, and occasional instances show extensive damage, as in the case of the $350,000 fire in the Boston residence of ex-Governor Draper; this was traced to an electric plate warmer in the butler's pantry.

Fires of this class furnish a special peril to life, being most frequent in dwellings and often breaking out at night. A characteristic example is that in which an electric pressing iron is left upon the ironing board, with the current turned on, and then forgotten. In such a case the fire may not occur until some hours later. The burning of the residence of John Wanamaker, several years ago, was due to an electric pressing iron.

That this form of hazard is already assuming large proportions appears from the statistics. For example, the Actuarial Bureau of the National Board of Fire Underwriters in one day noted approximately one hundred reports of fires from this cause, out of a total of two thousand losses in the day's reports, and it estimated that small electrical devices are causing fires at the rate of 30,000 or more in the course of a year.

It is safe to say that most of these fires are entirely preventable, and can be charged to nothing but carelessness on the part of the user. Various "safety" devices have been added by certain of the manufacturers of these articles, and among them are some that are fairly effective, but there is one absolute precaution which should be borne in mind at all times by every user, namely, that of *shutting off the current* when not *personally and continuously* supervising the use.

Determination of Interval Between Boiler Cleanings a Problem for Operating Engineer

The effect of boiler scale in lowering the rate of heat transmission from the hot gases to the water has been pointed out so often that engineers are well aware of the fact that it lowers efficiency. The danger of overheating, and thus weakening the boiler metal, by allowing scale to accumulate in considerable quantities, has been explained again and again. From the viewpoints of thermal efficiency and safety, therefore, nothing new remains to be said. There is one phase of the matter, however, states the December, 1916, issue of the *National Engineer*, that seems to be less frequently adverted to, namely, the expense involved in removing incrustation. When scale and sediment have accumlated to such an extent that they must be cleaned out, the boiler is cut out of service, cooled, emptied, and opened, and the deposits on the plates and tubes are removed by hammers, picks, scrapers, and chisels, and by various forms of rotating cutters driven by steam, air, water, or electricity.

The cooling and emptying of the boiler involve a loss of all the heat stored up in the water and the setting, and the consequent change of temperature of the furnace lining cannot but prove detrimental to the brickwork. Moreover, an equal amount of heat must be expended, when the boiler is again put into service, to bring it up to the normal working condition. The opening of the boiler, to gain access to the interior, compels the breaking of joints at manholes and handholes, and the spoiling of gaskets that must be replaced by new ones when the boiler is closed after cleaning. The time and labor required for performing the actual cleaning of the metal surfaces comprise an appreciable item of expense, and in addition there must be taken into account the damage done to the tubes and plates by the cleaning tools. If the cleaners are of the mechanical type, they not only run up a bill for power required to drive them, but also represent a considerable initial investment. Considering the fact that the cleaning of a boiler is so expensive, it follows that there must be a certain most economical interval between cleanings for each boiler operating under a given set of conditions. If the boiler is cleaned too frequently, the gain due to more rapid heat transmission will be more than offset

by the increased expense of cleaning; and if there is too long an interval between cleanings, the heat lost up the chimney will be excessive. The determination of the approximate time that may be allowed between cleaning operations, so as to obtain a desirable ratio between the heat saving and the expense of scale removal, is a neat little problem for the operating engineer.

Only a Prosperous Utility Can Serve the Public Satisfactorily and Acceptably

Starvation Wages Never Produced a Good Output for Any Employer, and It Is Equally True That a Public Utility, Living from Hand to Mouth, Is Unable to Give First-Class Service to the Public

It is comparatively easy to define the proper relation of public utilities to the public, but very difficult, under present conditions, to produce such relationship in actual practice, declared W. W. Freeman, president of the Union Gas & Electric Company, of Cincinnati, Ohio, in a paper presented at a meeting of the American Institute of Electrical Engineers, held recently in Chicago.

The primary excuse for the public utility is the need of the public for the service which the utility is created to render. If such service is rendered efficiently and honestly, the utility is a distinct benefit to the public and is entitled to be recognized as such. The chief obligation on the part of the utility is that the service shall be first-class and the rates reasonable, and, on the part of the public, that these conditions being met, no restrictions shall be imposed which make it impossible or difficult for the utility to perform its proper functions.

Upon this outline of axiomatic principles, there is probably little disagreement in any quarter. The difficulty arises principally in the fact that partisans on both sides claim that the opposing side is unwilling intelligently and impartially to ascertain the facts governing the cost and character of the service, and to be bound by them. The public utilities generally are keenly alive to their full measure of responsibility to the public and are anxious to have the public know this and have true and full knowledge of all of the facts which bear upon their proper relations.

How Public Support May Be Secured

The secret of securing public support for public utilities consists in arousing the enlightened self-interest of the public to a realization of the fact that only a prosperous public utility can serve the public satisfactorily and acceptably.

A financially impoverished utility cannot serve the public acceptably any more than an unnourished servant can do good work for his employer.

Starvation wages never produced a good output for any employer, and it is as invariably true that a public utility, living from hand to mouth, is unable to give first-class service to the public.

This matter goes deeper than the mere question of wages and food. Every thoughtful person realizes that an employer who is constantly criticizing his men without just cause, or who permits others to do so, is thereby reducing the efficiency of their work and injuring his own interests.

Correspondingly, a public utility which is subjected continually to criticism and abuse from thoughtless or malicious elements in the community is thereby prevented from rendering to the public as loyal and efficient service as it could otherwise do.

Protection by the public of the bonafide investment of the utility must be assured if the service of the latter is to be adequate and satisfactory at all times. This can only be done by earnings sufficient to insure the stability of the property, which must include an adequate rate of return to the investors, so as to induce new capital, as required from time to time for the expansion of the business in the public interest.

As to the reasonable rate of return, neither the company nor the public can assume to determine the same as against the investor who must furnish the capital.

If public utilities are restricted to rates of return which are unsatisfactory to investors, the inevitable result will be to curtail further investments in utilities, which will mean denial of extended service and impairment of the present service to the public.

Attitude as to Return on Investment Must Be Liberalized

There has been a tendency in past years to arbitrarily determine certain fixed percentages as representing the allowable fair rate of return for public utilities; these percentages in some instances being as low as 6 per cent. per annum, more often 7, 7.5 or 8 per cent. and in some particular cases as high as 9 or 10 per cent. It must be recognized that unless the rate of return allowed to public utilities is comparable to the returns allowed in other lines of business, where the risk is no greater, that the inevitable result must be disastrous to the public. If the public interest is to be best served the attitude of regulatory bodies in this respect must be liberalized in the future.

Another very desirable condition is to furnish the public utility with sufficient incentive to unusual efficiency, to insure the highest grade of service at all times.

This can only be done effectively through a proper sharing of the advantages of such unusual efficiency between the company and the public.

An absolute limitation as to net earnings, irrespective of the efficiency of the service rendered, can never result in the highest degree of efficiency.

Human nature does not permit 100 per cent. efficiency at all times without some selfish inducements being offered.

In other words, there must be a stake if the company is to be expected to play the game at high pressure. Regulation of prices, based solely upon definite rates of return, tend to carelessness as to expenses, since the company has nothing particularly to gain by reducing its expenses after the net revenue is equal to the allowable rate of return. The public would be better served in such a case if efficiency were stimulated by a division of results.

Maximum efficiency is what the public should seek and the necessary and reasonable compensation for same should be promptly forthcoming.

Sales of Gas for Street Lighting Increases in Massachusetts Cities

That the use of gas for the illumination of public streets is not on the wane is clearly indicated by returns of Massachusetts gas companies to the state board of electric light commissioners.

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CONTENTS

GAS-FIRED SODA KETTLES PROVIDE EFFICIENT MEANS OF CLEANING METAL PARTS—TANK FURNACES HAVE MANY USES, BY GILBERT C. SHADWELL 169

MULTIPLICITY OF APPRAISALS A HEAVY BURDEN IN PRESENT-DAY REGULATION 175

FAR EASIER TO PROTECT LIGHTING BUSINESS THAN TO REGAIN IT 173

160 CU. FT. OF 580 B. T. U. GAS PER HOUR REQUIRED FOR OILING TEMPERING FURNACE FOR RIFLE BODIES, BY WILLIAM J. HARRIS, JR. 177

EDITORIALS 180

PATENTS PERTINENT TO GAS INDUSTRY 185

NEWS OF THE GAS INDUSTRY 188

SOCIETIES AND ASSOCIATIONS 190

CONSTRUCTION NOTES 191

PERSONAL NOTES 191

FINANCIAL NOTES WILL BE FOUND ON PAGE 16 OF THE ADVERTISING SECTION.

Standardization

To-day seems to be a day of standardization in the gas business. We are standardizing gas ranges, room heaters, and gas lamps. There has not been so much done, however, along the line of standardizing the service rendered to the consumer. The service which at present appears to require the greatest attention is that of gas lighting.

For a hundred years the use of gas lighting has been constantly increasing.

If the sale of gas for lighting purposes is not increasing to the extent we consider it should be there must be something wrong with the lighting service that is being rendered by gas companies rather than to any inherent defects in gas lighting. Any one who uses gas lighting under favorable conditions finds it the most satisfactory light.

Since the goods are right the trouble must lie in the service that is being rendered. Those gas companies that are rendering the best lighting service to their consumers are securing the most lighting.

There are gas companies that are still securing five and ten year street lighting contracts in competition with electric lighting.

These companies are careful to give good lighting service.

In fact their street lighting probably proves more satisfactory than electric street lighting due to the service that results from two inspections daily.

These companies also give careful maintenance to their commercial and residential lighting. As a result of this maintenance service their gas lighting is increasing in the manner its merits entitle it to increase.

These companies are proving that with good service there is no difficulty in selling gas lighting.

This being the case why should not work be done on standardizing the service that must be rendered the consumer in order to hold and to gain gas lighting.

It is very probable that if more investigating should be done in regard to the rendering of lighting service that the problem of standardizing the maintenance of gas lighting burners and equipment would be greatly simplified. Already there are enough gas companies making a real success of their gas lighting to make it comparatively easy to gather together the information that will be necessary in order to establish standards of service.

We, therefore, recommend to the various gas associations that they give more attention than has ever before been given to the gathering together of data on gas lighting and the establishing of standards of service which if lived up to will certainly result in an increase of gas lighting.

Working Actively to Secure the Elimination of the Open Flame Burner

Quite frequently those of us who attend gas-lighting exhibits and who never associate gas lighting in our minds with anything other than the most modern appliances, are reminded that our old friend the open flame burner is still in service. It isn't often we get so severe a shock as we received when the Chicago discussions brought out the startlingly large number of such burners that are still in use in that city, but they are sufficiently

strong reminders to compel us to readjust our ideas nevertheless.

This journal does not believe there is one gas company which would not be well pleased if an incandescent gas mantle superceded every open flame burner in its territory. But how far will such companies go in actively campaigning to secure the elimination of the old-type, wasteful burners?

Dissertations on relative economy will, without doubt, accomplish a great deal along these lines, but such dissertations too often fall flat when their offshoot is a proposition to invest a lump sum on their replacement. Our arguments too often have a boomerang effect. They succeed in impressing the layman with the wastefulness and unsatisfactory service of one type of gas lighting, but do not at the same time impress him with the advantages of adopting the other type.

Once convinced that a change is necessary the consumer, under present-day methods, too frequently gets the idea that economy lies in the direction of electric lighting. Why? For the simple reason that the electrical man will cater to his convenience. It costs something to-day to secure a gas-lighting installation. It costs practically nothing, at the outset, to get electric lighting.

The so-called free-maintenance plan, this journal is convinced, would have an excellent effect in increasing our gas-for-lighting sales. We must make it as convenient for the consumer to secure modern, efficient gas lighting as it is for him to obtain electric lighting.

Conserving Our Coal Supply

There are certain industries in the United States that are noted for their utilization of all by-products. It has become a common saying that in the packing industry everything about the pig but his squeal is manufactured into something useful. Packers have even gone so far as to conduct sporting goods stores in order to sell tennis rackets, etc. into the manufacture of which some of their by-products enter. The Standard Oil Company no doubt owes much of its success to its practice of utilizing all of its by-products. In fact, some of its products, which formerly were merely by-products, are now becoming the most important products.

Two great industries, the gas and electric industries, have never utilized their by-products to the same extent that the above-mentioned industries have. Each year electric central stations destroy thousands of dollars worth of hydrocarbons and nitrogenous compounds by burning undistilled coal under their boilers. This great waste of the country's resources has long been apparent and a good deal of work has been done by inventors with the object in view of making it possible to distill the coal, and using as fuel only the carbon and gases in the coal. This would mean that the tar and the ammonia compounds would be saved and utilized in the industries to much greater advantage than they are at present when destroyed in the fire-boxes of boilers. The difficulties in the past have been that the cost of the apparatus and the cost of operating and maintaining it have been so great that the extraction of these products by any known method was prohibitive. It is now rumored, however, that an English electrical engineer has developed a method which is both practical and economical.

This suggests the question: What is the gas industry going to do in solving this problem? The gas industry like the electrical industry has not gone to the extremes that the oil and the packing industries have in the utilization of by-products. The present dye situation is a demonstration of this fact. A great deal of coal tar is used before many of the valuable chemicals it contains have been extracted. The reason for this has been the same reason that electric power stations have burned undistilled coal. The cost of extracting these chemicals from the tar of a medium-sized gas works has been so great as to leave no profit, and the cost of shipping to some central point and then extracting it has also proven more expensive than purchasing the chemicals from Germany.

The secret of low costs of manufacture, as the automobile industry has so ably demonstrated, lies in quantity production. It is apparent that if the gas industry could distill, not only all the coal required to furnish gas to our cities and towns, but also all that is required under the boilers of electric power stations the increase in production would place the industry in an entirely new position. The power companies could burn both the coke and the gas so that the only by-products which would be increased in the gas works would be the tar and the ammonia products. At the present rapid growth of the electric and the gas business it is apparent that many more gas plants than at present could operate their own refining works and that ultimately the gas industry would become of far greater value to the country even than it is at present as a conserver of the natural resources.

The work of extracting the tar and the ammonia compounds from coal falls logically to the gas industry. The gas industry is in reality a chemical industry, while the electrical industry is founded upon the science of physics. It is apparent, therefore, that to secure the best results the electric men should turn over the work of distilling coal to the gas industry and confine their attention to the generation and utilization of electricity.

There apparently is no obstacle in the way of such co-operation except the formulation of suitable contracts between the gas and the electric companies. It is conceivable that such contracts can soon be made which will prove both satisfactory and profitable to the electric men, the gas men and the public. The use of gas as a fuel would greatly reduce the boiler room labor. It is conceivable too that the coke that would have to be burned in order to secure a low enough rate for the fuel could be pulverized and burned in the same

fire-boxes in which gas fuel is burned. In other words that the use of either gas or pulverized coke as a fuel could be made interchangeable.

When one stops to consider the immense consumption of fuel which now takes place in electric power stations, and that all this fuel could be supplied from gas works, he begins to realize the wonderful possibilities of this latent market. This market, however, would not only greatly increase the sale of gas and the size of the gas industry, but it would prove of incalculable value to the country by conserving the supply of nitrogenous compounds. It would not only have its effect upon the clothes we wear through making the recovery of the tar-derivatives possible and profitable, but it would also have its effect upon the food we eat by furnishing to plant life the nitrogen so essential to such life. The problem, therefore, would seem well worth the attention of the greatest thinkers in the industry.

The Raw Material Situation

State and municipal commissions are taking a hand in the fixing the rates and the standards of service of gas companies to a greater and greater extent. A great many gas companies would have a great deal of difficulty in raising their rates. Gas companies are also expected to supply gas of a given heat or candle power value and most important of all render continuous and un-interrupted service.

What, however, is the condition that these gas companies are now facing in the raw material market? All gas companies must have coal. Gas companies generating water gas must also have oil. Both of these have to be transported to the works either by rail or by boat. All of the coal supply must be carried a certain distance by rail for even if the gas works are situated at tidewater the coal must be transported by train from the mine to the docks for reshipment by rail.

Whenever there is an increased demand for coal or there are labor troubles the price for coal goes up, but gas companies are not given the privilege of correspondingly increasing the price of gas. Neither can the gas companies increase their rates when there is a greater demand for gas, one so great in fact that it will necessitate the building of larger works.

Gas companies are now facing this condition. Not only has the price of both coal and oil greatly increased on account of the increased demand due to the war, but the increase in freight traffic has caused congestion and car shortage that often makes it difficult to secure coal and oil at any price. Most gas companies carry a large reserve stock and for that reason have not felt the seriousness of the situation to anywhere near the extent that they will in a few months more unless there is something done to remedy the present conditions. It would seem that either gas companies should be given the privilege of increasing their rates or the Interstate Commerce Commission should see to it that the railroads deliver all necessary raw material to public utilities as rapidly as they require it.

There are possibly no fuel users in any communities whose services are more important or more necessary than the services rendered by the gas, electric and traction companies. As has already been stated these companies are usually closely regulated by either municipal or state commissions and their selling prices are fixed. When the price of raw material increases, the efficiency of operation must be increased or dividends reduced. The first condition is not as easy to effect as the glibness with which it is so often uttered would imply.

The service rendered by these utilities as well as their profits are now to a very great extent dependent upon the service rendered by the railroads. Unless the roads deliver the raw material the companies of course cannot make gas. If inferior coal must be used because deliveries cannot be secured from the mines supplying better coal, the quality of the gas suffers. The blame, however, in each case falls upon the service rendered by the railroads.

Many gas companies are now placing contracts for coal. They are not only paying very high prices for this coal but in far too many cases they cannot make sure that they will be able to get the coal delivered at the rate that is necessary to insure the best service to their consumers. Since the service the gas companies render is under more or less supervision why should not the service that the railroads render the gas companies also be under close supervision?

A Lesson from the Prohibitionists

During the past ten years people have seen state after state vote out the liquor traffic. In fact the temperance advocates have made greater progress during this period than during any like period since the movement started. In face of this fact it would appear to be wise to look into the matter to discover if possible a contributory cause for this recent rapid progress. There may be in it good food for thought in promoting other causes.

Investigation shows that only since it has become customary to teach the school children the ill effects of alcohol and to instill into their plastic minds before they become fixed the desire to eliminate it altogether as a beverage, that the temperance movement has become decidedly prominent. In other words, it has been the work done with the children during the past generation that has had as much to do in making states go dry as anything else.

This then is the lesson that the gas man can learn from the prohibitionists. When the children while still in school are taught either to use or not to use any method or substance, they are far more likely to abide by this teaching in after life than they would be if the work of persuasion had been left until they had become fully grown.

There, however, is not only a lesson to be learned but there is also a warning. It will never do to let a competitor teach the children more about his wares or services than we teach them about our wares and services. If he does he is bound to get more than his share of the business within a comparatively few years. The question for the gas man to decide is whether or not he is doing as much work among the school children as are his competitors.

Special English Correspondence

Monthly Letter from Norton H. Humphrys, Salisbury, England, 1917

The Status of the Freight and Transportion Problem Abroad—More About Ammonia Sulphate—Low Temperature Carbonization

Some attention has evidently been given to the subject of freightage in the United States, as affecting both the retail prices to small consumers, and the purchase in bulk, for industrial or manufacturing purposes, of coal and other utilities. The experiences on this side of the Atlantic, over the last two years, a reference to the published accounts of British coal and transport companies, and the market quotations for shares in such ventures, go to show that there is room both for inquiry and for Government regulation of rates, in connection with the freightage charges for the transit of coal and such like heavy merchandise. Whether the numerous combinations, trusts, and societies that are more or less interested in the question possess sufficient influence to continue the stifling of effective legislative interference, is an open question.

English Rail Rates Four to Six Times Those of Other Countries

Gas companies can charter their own cargo ships, and thus avoid shippers' charges, but have no corresponding-alternative in regard to rail-borne coal, and as a consequence are paying four and even six times the mileage rates that are current in other countries. The London gas companies, after some experience of seaborne freights from the North to the Thames, at the rate of $3.60 or $4.20 per ton, as compared with prewar rates of about 72 cents, are now providing their own steam colliers, and doing the work for themselves at something like one-fourth of the cost. A similar economy should be possible in connection with railway mileage rates. No benefit to gas undertakings or other consumers however can be expected to follow the appointment of commissions composed exclusively of coal and land owners, leading shippers and railway magnates, which is about as far as the Government appears inclined to go in the matter.

Coal Haulage Not Reduced to Minimum

Messrs. Smith and Lesher also make reference to the possible limitation of freightage, by reducing it down to the minimum mileage consistent with actual requirements. There is an immense amount of unnecessary overlap with us, in this respect. It is said that when a notable civil engineer was building railway viaducts in the southwest of England, he insisted on having all the lime required brought from the Midlands, a distance of perhaps 300 miles, in spite of the fact that the site of his operations was surrounded with excellent limestone. He had proved the one quality by experience, but knew nothing of the other. In a similar manner, certain brands of coal have acquired a sort of fictitious value in the estimation of users, and are frequently conveyed distances of 200 or 300 miles, passing several sources of equally good coal on the way. Gas coal from the Tyne is delivered into gas works in the south of England, notwithstanding the fact that fairly good gas coal is found within a radius of 30 or 40 miles, simply because the engineer or the stokers (who at present quite rule the roost) have always been used to north country coal.

Waste Through Empty Return of Carriers

But the great source of wastage in connection with railway haulage is the empty return journey. The coal may not only be carried 200 miles unnecessarily, but the truck or car has to make a return journey of equal length. Large users of coal invariably provide and own the necessary trucks, and these invariably go back empty. The procedure was the same with railway owned cars in pre-war times, but shortage of labor together with increased traffic for military purposes, have led to the introduction of a scheme for pooling cars under the direction of the national railway executive committee thus improving matters in this respect.

In the shipping industry it is found possible to avoid the barren return journey, and endeavors should be made to utilize returning railway cars in a similar manner, but even now one often sees trains of 40 cars or more making a long and unprofitable return journey, for which the consumer eventually has to pay.

But superfluous freightage exists in many ways in connection with shipping, such as the transit of materials and goods from foreign countries that could be supplied at home, and wartime conditions give especial prominence to this phase of the question. If the origin of this class of traffic is a small difference in the selling price, the large increase in traffic costs may serve to entirely neutralize it. One sometimes wonders whether the Government is not laughing in its sleeve, and looking with some degree of complacency on enormous freightage profits, with an eye to the heavy super-tax on excesses, or to the encouragement, by such means, of home and local manufacture. Also that the beneficient action of the laws governing the sale of gas, in regard to their effect on the pocket of the consumer, has not attracted more attention. The man in the street does not recognize the difference between a limited and an unlimited monopoly, between a privilege that carries no obligations, and one that includes an equivalent in the shape of regulations as to rate of profit, selling prices, and quality of the article supplied. Gas undertakings do not enjoy any special privilege in respect to expenditure, but have to buy in the open market at current prices, the same as a private individual. They have in addition to contend with particular disadvantages such as loss of business due to daylight saving, and restrictions on the sale of tar. Yet while all the other necessaries of life have advanced 50 to 100 per cent. in price,—the railway companies have increased passenger fares an all-round 50 per cent. as from the 1st inst.—advances on the price of gas over the last two years do not average more than 10 or 12½ per cent.

Ammonia Sulphate Necessary for Home Food Production

Following the remarks on ammonia sulphate as a national asset in my last letter, the matter has subsequently attracted much attention, in connection with the obvious immediate necessity for substantially increasing the home production of food materials. The Sulphate Ammonia Association do not claim to be more than ordinary business men looking after their own interests, but going beyond that view, it is evident that in directing attention to the value of a home manufactured fertilizing agent, they have performed an important public service, and that their patient endeavors, over several years past, in the way of encouraging its use, turn out to be a great public benefit at the present juncture. Professor Somerville, writing in *Blackwood's Magazine* argues that there can be no doubt as to the possibility of an immediate increase in the agricultural produce of this country by applying the whole of the home product of ammonia sulphate and basic slag to British land, instead of importing large quantities to other countries, and Mr. Scott, the chairman of the Parliamentary Agricultural Committee, states that the question of fertilizers is of primary importance, as no great increase of production is possible without drastic treatment of the fertilizer problem. In 1911, it was shown that Belgium was using three times as much nitrogen, more than twice as much phosphate, and 35 times as much potash, as the United Kingdom, which went far towards explaining the immensely greater yield per acre in that country.

Have Exported Sulphate Needed at Home

Yet even during the war, when we ought to be greatly increasing our use of fertilizers, we have been exporting immense quantities, all of which should have been used at home. In 1915 we exported three-fourths of our make of ammonia sulphate, every ounce of which was needed here, as every cwt. put into the ground would add four bushels per acre to the yield of wheat, six to that of oats, and half a ton to the crop of potatoes. A cwt. of sulphate, including labor in spreading, would cost the farm perhaps $7.20, and would evidently prove a most profitable investment, and the producers of sulphate should take care to make proper use of such remarkable independent testimony as to its manurial value.

The *Times* expresses the belief that the board of trade has resolved to strictly prohibit the export of ammonia sulphate, and has received the active co-operation of the Sulphate of Ammonia Committee in this decision. As much has not yet been accomplished, but there is a large home demand, and many gas undertakings in this neighbourhood have sold forward the whole of their make up to the end of March. Another proposition is that the use of a minimum proportion of fertilizer per acre of land shall be made compulsory, or that if a farmer objects, the Government Commission shall take the land in question in hand, supply the manure, pay the occupier a fair price for labor and cultivation, and take possession of the crop, which means that they accept the whole risk attaching to the innovation.

Gas engineers have always recognized the importance of this question, and when they first took up the manufacture of sulphate, some fifty years ago, they believed that the home consumption would include the whole of the make. They have put forward many endeavors in the way of encouraging its use, but for various reasons that are outside our province, their efforts were only attended with a very indifferent amount of success. Now that attention has been directed to the national aspect of the matter, there is good reason to look for a decided and permanent improvement in the home demand, one advantage of which will be the avoidance of superfluous freightage as above instanced, and the freeing of shippings tonnage for indispensable requirements.

Coal Retorted at High and Low Pressures

While the necessity for coal economy has been so successfully urged, mainly through the energy of Prof. Bone of surface-combustion fame, that the Privy Council Committee on Scientific and Industrial Research is taking up the question, there is a movement on foot in favor of low temperature carbonization, and gas engineers are plainly told that when they retort coal at high temperatures, they are ignorant and unscientific, and twitted as being unable to understand anything beyond a large make per ton. It is true that retort house costs turn more on the tonnage of coal handled than on the quantity of gas made, and gas engineers, with that point prominently in sight, have in the course of time largely increased the make per ton, to the advantage of all concerned, and as one of the thick headed ones, I am naturally unable to see where economy of fuel is to be gained, by using 32 million tons of coal in place of the 16 million that is, under present working, retorted in gas works in the course of a year. It is admitted that the low temperature system yields 6,000 cu. ft. of gas per ton of coal carbonized, and the present average is about 12,000, but there would be a theoretically larger yield of soft coke, which is supposed to be superior to gas coke for many purposes as a fuel. The claim has not been supported by actual facts, and the public will need a great deal of education before they will take kindly to half-baked coke at a high price. The position in regard to the undoubtedly larger yield of liquid products stands in much the same position, and experts differ considerably as to the value, as compared with that of ordinary gas works, tar and liquor. The general experience, in small gas works at any rate, tends to make one consider how to reduce, rather than increase, the production of liquid residuals. The high temperature engineer can satisfy his customers, as shown by increasing business in the teeth of competition in more than one direction. But I have yet to learn that any low temperature method has proved a commercial success, or offered promise of a national benefit as a means of economizing the consumption of coal.

Plastic Composition for Making Fire Bricks

Patent No. 1,209,784; described in Patent Office *Gazette*, 12-26-16, page 1159. Earl V. Wagner, Scranton, Pa., assignor to Wagner Fire Brick Company, Helena, Mont. Original application filed Jan. 8, 1916. Serial No. 70,983. Divided and this application filed Aug. 5, 1916. Serial No. 113,221. (Cl. 106-11.)

This composition consists of coal ashes, one hundred pounds; alumina, two pounds; water, two to two and one-half gallons.

Patents Pertinent to Gas Industry

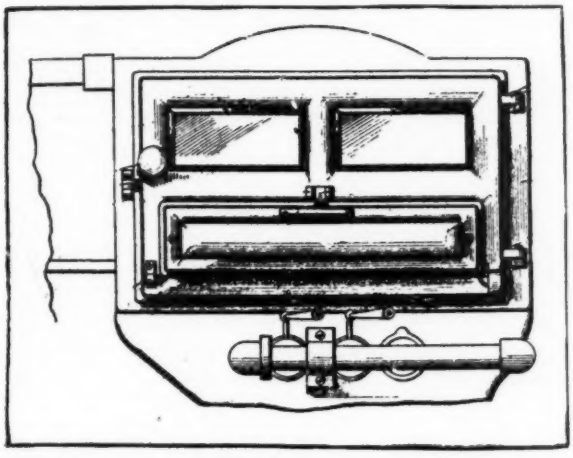


FIG. 1. SHOWING DOOR WITHIN A DOOR FEATURE

Oven Door for Gas Ranges

Patent No. 1,209,326; described in Patent Office *Gazette*, 12-19-16, page 968. Anselm T. Nye, Marietta, Ohio. Filed April 5, 1916. Serial No. 89,162. (Cl. 126-190.)

In this oven door on a range having two ovens, a smaller door is provided which opens into the lower oven.

Cold Water Supply Connected to Tank by New Form of Coupling

Patent No. 1,209,063; described in Patent Office *Gazette*, 12-19-16, page 879. John R. Steneck, Oak Park, Ill., assignor to Illinois Malleable Iron Company, Chicago. Filed Oct. 27, 1915. Serial No. 58,188. (Cl. 126-362.)

The cold water connection to the tank in a hot water circulating system is made by the use of a circulating union coupling. This coupling comprises a male ell, a tail piece, and the nut which is carried on the tail piece. At the lower end of the tail piece is a male thread which screws into the tank, while the inside is also threaded to provide the means for connecting the pipe extending down into the tank to convey the cold water to the bottom of the tank. The tail piece has an enlarged section, and by cutting away portions of the female thread, circulation between the fitting and the tank is provided.

Oven for Gas Stove May Be Divided Into Two Sections

Patent No. 1,209,348; described in Patent Office *Gazette*, 12-19-16, page 976. Charles H. Steadman, Marietta, Ohio. Filed April 4, 1916. Serial No. 88,858. (Cl. 126-39.)

In this oven, a division plate which is removable divides the oven into two parts. Independent upper and lower side flues are provided. The inner walls of the lower side flues are slotted and communicate with the upper oven, the inner walls of the upper side flues being slotted and communicating with the main vent pipe.

A Combination Monkey and Stillson Wrench

Patent No. 1,209,002; described in Patent Office *Gazette*, 12-19-16, page 858. Percy A. Martin, Columbia, Mo. Filed Aug. 26, 1914. Serial No. 858,703. (Cl. 81-174.)

This wrench is arranged as a monkey wrench on one side and as a Stillson on the other side. The same nut and shank forms the basis for each wrench.

Ratchet Wrench Operates by Two-Toothed Pawls

Patent No. 1,209,320; described in Patent Office *Gazette*, 12-19-16, page 966. David Morneweck, Fredonia, Pa. Filed July 16, 1914. Serial No. 851,361. (Cl. 81-63.)

In this wrench the mechanism chamber is closed by a closure plate, the body of the wrench and the plate forming annular flanges. The turning head, constructed with a ratchet, rotates in the chamber, and engages the flanges. A double-ended pawl, pivoted on the bolt which holds the closure plate to the mechanism chamber, engages the ratchet on the turning head. A crosshead is also mounted in the same chamber, springs connecting the pawl with the crosshead. A handle actuates the crosshead, which controls the operation of the pawl.

Apparatus for Mixing Gas and Air Maintains Same Proportions Regardless of Relative Pressures of Each

Patent No. 1,208,654; described in Patent Office *Gazette*, 12-12-16, page 696. Edwin A. Reeves, Milford, Conn. Filed Nov. 26, 1915. Serial No. 63,692. (Cl. 48-184.)

In this apparatus there is a main chamber which contains three smaller chambers; one a gas chamber, one an air chamber and the other a vacuum chamber, with a diaphragm in each. A gallery chamber is also provided

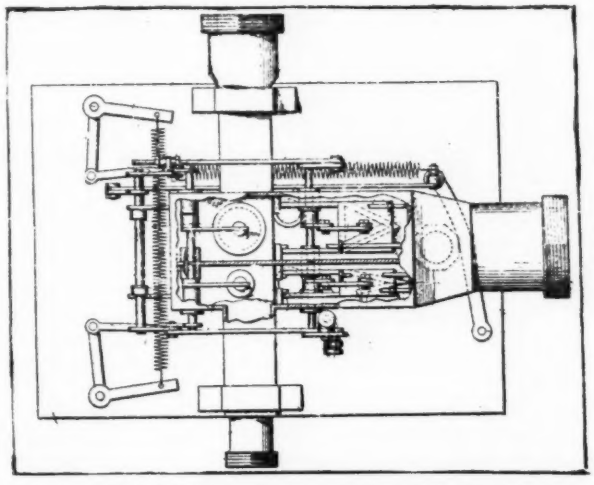
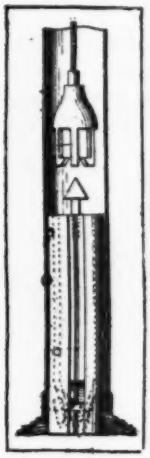


FIG. 2. VALVES ACTUATED BY DIAPHRAGMS CONTROL AIR AND GAS

containing a similar number and the same kinds of smaller chambers as are in the main chamber. The gas chamber in the main chamber is connected with the gas chamber in the gallery chamber; the air chambers and the vacuum chambers are likewise connected, and valves actuated by the diaphragms, control the flow of gas and air from one chamber to the other. A port connects the vacuum chamber with the gas and air chambers in the gallery chamber and a valve covers or uncovers this port, this valve being controlled by a diaphragm in the vacuum chamber of the main chamber.

Device Prevents Water Flowing Into Oil or Gas Wells



Patent No. 1,209,634; described in Patent Office *Gazette*, 12-19-16, page 1075. Calvin Sweet, Half Moon Bay, Cal. Filed Oct. 24, 1914. Serial No. 868,516. (Cl. 166-10.)

This device consists of a plunger which moves inside of the well casing and which has a flexible sleeve packing attached to the end of the plunger. The plunger is held tight against the well casing, and extends beyond the casing, the packing being kept extended until the plunger is withdrawn. The packing is then distended by the weight of the well casing, thus shutting off the flow of water into the casing.

Method of Saving Oil or Gas When Drilling Well

Patent No. 1,209,454; described in Patent Office *Gazette*, 12-19-16, page 1014. William G. Knapp. Alhambra, Cal., assignor of one-half to Arthur G. Willard, Los Angeles. Filed Jan. 3, 1916. Serial No. 70,060. (Cl. 166-14.)

In order to save oil or gas when drilling a well, a plunger is secured to the drill line, the plunger being somewhat longer than the stroke of the drilling tools. A stuffing box is placed on the well casing through which the plunger operates, this preventing leakage of gas at this point. At the top of the plunger another stuffing box allows the rope to pass through, and the rope is gripped by grips and clamps attached to the plunger.

Well Drill-Jar Composed of Two Integral Parts

Patent No. 1,209,347; described in Patent Office *Gazette*, 12-19-16, page 975. William A. Sparks, Charleston, W. Va., assignor to Sparks Drilling Jar Company, Charleston. Filed Oct. 3, 1913. Serial No. 793,203. (Cl. 255-27.)

A piston member and a socket member are the essential parts of this well drill jar. The piston member is provided with a shank with a cylindrical head at one end. The socket member is also cylindrical to permit rotary motion and is elongated to permit reciprocating motion. At one end of the socket member is a seat for the cylindrical head of the piston member, while midway is a shoulder for engaging the upper side of the cylindrical head of the same member.

Process of Manufacturing Carburizing Material and Oil Distillates

Patent No. 1,209,336; described in Patent Office *Gazette*, 12-19-16, page 972. Hugh Rodman, Edgewood, Pa., assignor to Rodman Chemical Company, East Pittsburgh, Pa. Filed May 24, 1915. Serial No. 30,039. (Cl. 148-25.)

This process consists in mixing the petroleum base to be distilled with an energizing agent prior to destructive distillation. After the destructive distillation has taken place, the distillates are collected, and the coked residue, with which is mixed the energizing agent, is removed from the coking still.

Pipe Tongs Composed of Several Parts

Patent No. 1,209,630; described in Patent Office *Gazette*, 12-19-16, page 1073. Randolph W. Shipley, Drumright, Okla. Filed Sept. 12, 1916. Serial No. 119,796. (Cl. 81-80.)

This pipe wrench consists of a shank, one end forming the stationary jaw; a movable jaw being pivoted at one end to the shank. One end of a link is connected to the movable jaw, while the other end is connected to an operating lever, which is pivoted to the shank.

Chain Tongs Are Provided with a Spring

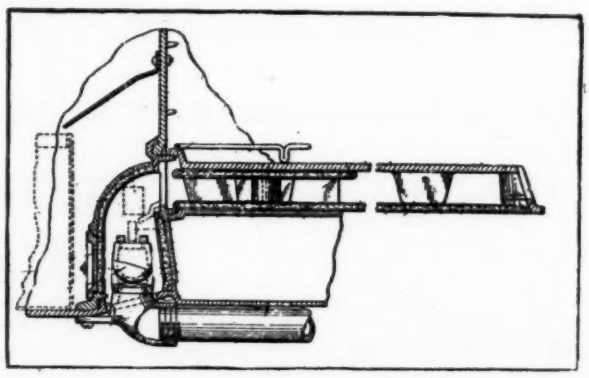
Patent No. 1,209,049; described in Patent Office *Gazette*, 12-19-16, page 874. William P. Sheets, Princeton, Mo. Filed Sept. 14, 1916. Serial No. 120,143. (Cl. 81-68.)

These chain tongs comprise two levers. A leaf spring is secured to one of the levers, an adjusting screw controlling the spring. The second lever is provided with a slotted hole and is attached to the first by a bolt, being fulcrumed on the spring attached to the first lever. The chain is attached to the first lever, a hook on the end of the second lever providing the means for gripping the chain. A cushion is also attached to the first lever, to be interposed between the pipe and the chain and prevents abrasion of the pipe.

Coal Range Equipped to Burn Gas

Patent No. 1,209,288; described in Patent Office *Gazette*, 12-19-16, page 955. Augustus F. Harter, Chicago, Ill., assignor to Cribben & Sexton Company, Chicago, a corporation of Illinois. Filed Aug. 21, 1914. Serial No. 857,826. (Cl. 126-36.)

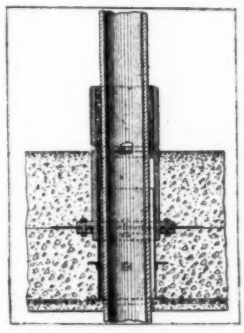
A combustion chamber is formed in the lower corner of the ash pit of a coal range and means are provided to insert gas burners into the combustion chamber. From the combustion chamber an opening is made just above the oven bottom and suitable insulating plates are provided to properly confine the products of combustion beneath the oven.



Pipe Sleeve Prevents Leakage of Water Through Floors

Patent No. 1,210,217; described in Patent Office *Gazette*, 12-26-16, page 1311. George W. Schodde, New York, N. Y. Filed April 21, 1916. Serial No. 92,632. (Cl. 126-314.)

This sleeve is to be used in connection with a molded floor, and allows the pipe to freely expand and contract. A flange extends laterally around the sleeve about half-way through the thickness of the floor in order to prevent leakage of water through the floor along the exterior of the sleeve. A supplemental sleeve, placed inside of the first sleeve, extends beyond the first sleeve to complete the sleeving through the entire floor. The main portion of the sleeve extends beyond the level of the floor line in order to prevent water from passing through the annular passage between the outside of the pipe and the sleeve. This space may be filled with some suitable packing material.



CROSS SECTION SHOWING SLEEVE

Apparatus for Condensing Ammonia Consists of Concentric Pipes

Patent No. 12,210,142; described in Patent Office *Gazette*, 12-26 16, page 1284. Louis Block, Mamaroneck, New York. Filed Dec. 2, 1912. Serial No. 734,651. (Cl. 257-40.)

In this condenser the pipes are placed in the ordinary trombone coil, a smaller pipe being built inside of and concentric with the larger pipes. Gaseous ammonia is supplied to the inside pipes at the lower end of the coils, and passes upward through the convolutions of the pipe. Cold water is passed in a counter direction, in the annular space in the larger pipe. The condensed ammonia is removed from the coils, a portion being reintroduced to any desired extent with the ammonia gas at the bottom of the coil. A check valve prevents any return flow of gas, and means are provided for preventing the discharge of uncondensed gas.

Thermostat Controls Gas to Burners in Metal Melting Operations

Patent No. 1,210,045; described in Patent Office *Gazette*, 12-26-16, page 1250. Millard Butts, New York, N. Y., assignor, by mesne assignments, to Intertype Corporation, a corporation of New York. Filed May 16, 1914. Serial No. 839,152. (Cl. 236-5.)

The gas inlet and outlet connections are in a valve chamber and in this valve chamber is a valve which opens or closes the inlet pipe. The valve is operated both by a spring which tends to close it and by a rod which opens it. This rod is connected to the lower end of a hollow member which has a relative high coefficient of expansion. The hollow member is inserted in the metal, and the valve is sufficiently opened, by an adjusting screw, to allow the proper amount of gas to flow to the burner to establish the proper temperature in the metal. After this temperature is reached, the expansion or contraction of the immersed member (as the metal increases or decreases in temperature) actuates the internal rod, which has a relatively low coefficient of expansion and which in turn operates the valve, to allow more or less gas to pass through the inlet of the valve to the burners.

One Die Stock Used on Four Different Sizes of Pipes

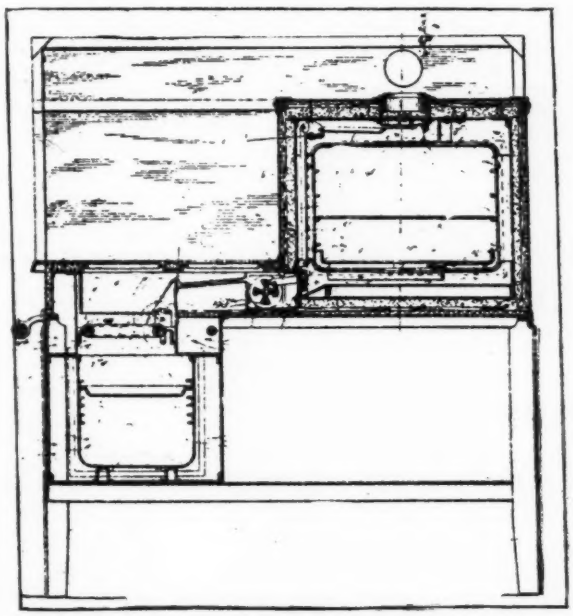
Patent No. 1,210,188; described in Patent Office *Gazette*, 12-26-16, page 1301. John B. Martens, Cleveland, Ohio, assignor to Morris Cramer. Filed May 4, 1916, Serial No. 95,462. (Cl. 10-114.)

The dies are carried on the inner side of the frame, and if it is desired to change them, the face of the stock is swung out on hinges, when the old dies may be removed and the new ones inserted. The guiding bushings are on the outside, which allows a much shorter piece of pipe to be threaded. By locating the dies on the inside of the frame, they are also protected from injury.

Stove, Provided With One Set of Burners, Accomplishes All Desired Results

Patent No. 1,209,683; described in Patent Office *Gozette*, 12-26-16, Page 1124. Forest V. Detwiler, Grand Rapids, Mich. Filed April 21, 1915. Serial No. 22,938. (Cl. 126-39).

In this gas range one pair of burners supplies all of the heat for top cooking, oven heating, and broiling, an arrangement of dampers deflecting heat from the burner box to the oven. The broiler is located underneath the burners, and the burners may be turned over to direct the heat downwardly to the broiler. The oven has heat retaining features, so that it may serve as a fireless cooker, after being sufficiently heated, the heat circulation being especially controlled. Gas may be supplied to one or both of the burners as desired, and a pilot light is provided.



ONE PAIR OF BURNERS FOR COOKING, HEATING AND BROILING

News of the Gas Industry

Chicago Council Committee Votes to Lower Heat Standard—Not Candle Power

A gas standard of 565 B.t.u. and nine-candle power was recommended by the council committee on gas, oil and electric light recently by a vote of 7 to 3.

The gas company asked that the state utilities standard for gas be substituted for the city requirements in order that the company would be justified in building a new coke oven plant at a cost of $12,000,000 to $15,000,000.

On the recommendation of E. W. Bemis, the committee adopted a standard of 565 heat units and nine-candle power. This differs from the state regulation in that the latter does not contain a candle power requirement.

W. G. Woolfolk, engineer representing the gas company, protested against the inclusion of any candle power and the matter is still in doubt as to whether the company will accept.

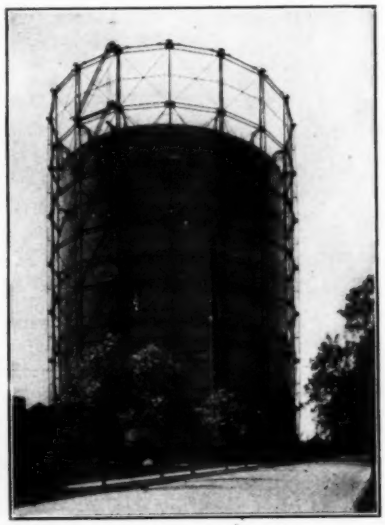
A Sight-Seeing Invitation from Baltimore Company

A bird's-eye view of Baltimore was given during the week ending Feb. 13 to thousands of Baltimoreans who visited the new Lexington Street Building of the Consolidated Gas & Electric Company. The twentieth floor of the building was converted into an observatory and exposition floor, 275 feet above the pavement. A count of the persons who took advantage of the hospitality of the company was begun in the morning as soon as the doors were thrown open. The counting machine refused to work after 3,000 persons had been registered. This was at one o'clock, but the continuous stream of visitors did not halt, despite the stopping of the count. It is estimated that from 60,000 to 100,000 persons took advantage of the opportunity to take a real bird's-eye view of the city during the week.

The visitors were entertained intermittently by Gaul's Orchestra and the latest musical comedy hits on a player-piano. As the housewives watched the demonstration of the many gas and electric appliances they were served with the good things that were cooked upon them. Receipts for hundreds of tasty things were also given to those who wanted them. The sides of the floor are furnished with many comfortable seats, where a view of the city for miles in every direction may be had. A descriptive catalogue of the views in all four directions was presented to each guest. Many principal points of interest are explained in detail and in an attractive manner.

Beautifying Holder Surroundings

Many gas companies in every part of the country are putting forth their best efforts to beautify holder surroundings. the illustration shown above is the Sixty-fourth street holder of the Peoples Gas Light & Coke Co., of Chicago, Ill., and shows clearly the progress which has been made in that city. As the holder is located in a high-class residential district the company has improved the property by parking with grass and flowers in an effort to make the surroundings as pleasing as possible.



SHOWING NEAT APPEARANCE OF HOLDER IN CHICAGO RESIDENTIAL DISTRICT

It was erected by the Bartlett-Hayward Company in 1907 and is one of the largest in the city, having a capacity of a little more than 5,000,000 cu. ft. This holder is supported on a pile foundation, consisting of 2,500 piles, each 30 ft. long and capped with a concrete floor 20 in. thick, which makes a very compact and satisfactory foundation. It is a 5-lift holder, each lift or section being about 43 ft. high and the height over all is 259 ft. 9 in.; the working height is 209 ft. The steel tank is 44 ft. 6 in. high and 183 ft. 3 in. in diameter while the top lift has a diameter of 169 ft.

Wage Increase by Citizens' Gas Light Company

Following the lead of the liberal-minded public service corporations throughout the country, the directors of the Citizens' Gas Light Company of Massachusetts have declared an increase in salaries to their employees of 10 per cent. to all receiving $3,000 or less.

Scranton Council to Ask Price of Gas and Water Plants

Provided the $4,000,000 approximate valuation as returned by the executors to the federal revenue department is found to correctly represent the total of W. W. Scranton's estate the city council will make an effort to ascertain the price the gas and water works could be bought for, if the city desired to take over the works for operation as municipal owned utilities. As the federal tax will not be due until Dec. 3 next, council will make no move in the matter until such time as the itemized return has been filed by the executors, showing how the taxable valuation of the estate has been determined.

Members of council have discussed the matter of the executors' approximate valuation and expressed surprise that the valuation has been set as low as $4,000,000. Still there was not a word of doubt as to the accuracy of the executors' figures, which must be regarded as correctly showing the value that they put on Mr. Scranton's holdings in the water and gas companies. It is commonly understood that Mr. Scranton owned at least eighty-four per cent. of the stock of the Scranton Gas and Water Company, a corporation that is capitalized at $4,000,000 and which in turn owns the entire stock of twenty-five other companies whose combined capital amounts to $4,300,000.

Some of the members of council said that already citizens have approached them with suggestions that council as the administrative authority for the city should buy up the works if they can be bought at anything like a reasonable consideration. Council concedes that this is the only proper move, but because the detailed return has not been filed the members thought that to open negotiations now would be premature.

Large Increases in Total Sales Reported by Massachusetts Gas Companies

The following gas companies in Massachusetts showed remarkable gains in sales for the year ended July 1, 1916, over the year before, as reported to the gas and electric light commissioners and embodied in statstics contained in the board's forthcoming annual report. Percentages of gains in total sales were:

Plymouth, 30.69; Arlington, 21.71; Lexington, 20.18; Amherst, 20.03; Athol, 18.74; Blackstone, 17.69; Webster, 16.41; Leominster, 15.05; Citizens', Quincy, 14.90. Average prices obtained for gas sold ranged from $2.766 per 1,000 cu. ft.,

for the Vineyard Lighting Company, Oak Bluffs (a summer resort), down to 60 cents, for the West Boston Company. Largest per customer sales reporter are Newton, 30,628 cu. ft.; Boston Consolidated, 30,178; Worcester, 29,564; Lowell, 26,749.

Total income for the year per 1,000 cu. ft. sold was: Brockton, $1.225; Taunton, $1.17; Arlington, $1.165; Citizens', Quincy, $1.126.

Expenses of distribution per thousand feet sold were: Brockton, 18.784 cents; Fitchburg, 15.345; Citizens', Quincy, 14.9; Lynn, 12.7. Dividends per thousand feet sold were: Citizens', Quincy, 25.688 cents; Brockton, 25.429; Springfield, 21,654; Arlington, 20.9; Fall River, 20.64; Taunton, 20.456.

Dividends, in per cent. on capital stock, for some of the larger companies were: Lynn, 20; North Adams, 18; New Bedford, 15; Charlestown, 15; Cambridge, 12.5; Fall River, Lowell, Newton, Springfield, 12; Worcester, 10.5; East Boston, Suburban (Revere), Taunton, Fitchburg, 10.

Missouri Utilities Company Gains New Charter by Consolidation

As a result of the consolidation of the Union Electric Light & Power Company of St. Louis with the Perry County (Missouri) Utilities Company, the Union company was granted a new charter with greatly increased powers. In addition to its former powers the company now has the privilege of doing a gas, water and ice business, and the privilege of operating all over the state of Missouri. Hitherto it has been restricted to the city of St. Louis.

In addition to enlarging its possible powers of doing business the new Union company changed the character of stock authorized to both preferred and common. The old company was authorized to issue only common stock.

Los Angeles Company Adopts Pension Plan

The Los Angeles Gas & Electric Corporation, by resolution of its board of directors, recently adopted, has put into operation a pension plan that will work great benefit to those for whom it was devised. The plan contemplates a pension both for age, disability and for sickness or accident. Its beneficial features apply to every worker carried on the company's rolls, from the humblest laborer to the highest-priced manager.

Boston Company's Report Shows Gain

The output of gas by the Boston Consolidated Gas Company for the month of December was 583,902,000 cu. ft., a gain of 7 per cent. over the similar month in 1915. The December output was the largest of any month during 1916.

Contemplated Gas Plant in Chicago Will Cost $15,000,000

One of the finest gas and coke plants in the world has been planned for Chicago. It is to be constructed by the Peoples Gas Light & Coke Company at a cost of $15,000,000, according to a recent announcement made by E. G. Cowdery, president.

The plant will be constructed along the drainage canal from Crawford Avenue to the Belt Line, just east of the western city limits. It will take from three to five years to build and will consume 1,500,000 cubic feet of gas and 1,000,000 tons of coke.

The construction is contingent upon getting the new franchise permitting the company to make gas on the heat instead of candlepower unit basis.

The company plans to obtain its coal from Pennsylvania, West Virginia and Lake Erie points, bringing it here on its own fleet of six vessels, 13,000 tons each, to cost between $4,000,000 and $5,000,000. Contracts for the vessels, President Cowdery said, probably will be let to some Great Lakes company.

Fuel dealers say a large coke supply is sorely needed in Chicago and its non-smoke producing qualities will be appreciated.

St. Joseph Plant at Full Capacity

The gas plant of the St. Joseph Gas Company is working to full capacity, twenty-four hours a day now, producing 3,000,000 cu. ft. a day, which is helping St. Joseph through the natural gas shortage siege.

Mr. Mitchell of the company returned recently from a two weeks' trip through the oil fields trying to match the oil supply with the necessary cars to transport it, and having indifferent success. There is a supply for about a week on hand, and the company will continue its efforts to keep ahead of the needs of the consumers.

Dallas Franchise is Postponed Pending Investigations

The board of commissioners of Dallas, Tex., has decided that due to the present gas shortage, the franchise question shall be held over until the next general election. The report follows:

"We, the committee of the whole, to which was referred for consideration the application of the Dallas company for a new franchise, beg leave to report as follows:

"Considering the shortage of gas which occurred several times during the winter, we do not believe it proper to attempt an immediate reduction in gas rates in the city of Dallas, nor that this should be attempted until an adequate supply of natural gas has been made accessible to the city of Dallas; that it will not be possible for the latter situation to occur until an exhaustive investigation has been made into the resources of the natural gas fields which are available to Dallas; that pending this investigation, and the conclusion which would be based upon it, it is not practical to attempt to conclude a new franchise with the Dallas Gas Company, as such franchise would necessarily be based on a supposed situation relative to natural gas supply, and not on complete information based on a full investigation of the facts.

"We therefore recommend that action with regard to the working out a new franchise with the Dallas Gas Company be postponed until the city of Dallas, through its generally constituted authorities, has full knowledge of the supply of natural gas available to Dallas, in addition to that which now exists."

Society of Gas Lighting

Minutes on the Death of William King, Honorary Member

With profound regret, we have learned of the death of our Honorary Member, William King.

Mr. King was made an honorary member of this society Dec. 15, 1877, and died Dec. 15, 1916; thus his honorary membership covered exactly thirty-nine years to the day. He also was honorary member of the American Gas Institute.

William King was born in Liverpool, June 2, 1839. His father, Alfred King, M.Inst.C.E., one of the most distinguished figures in the development of gas lighting, had succeeded his elder brother as engineer to the Liverpool Gas Company in 1826, and held that position until his death in 1867. At the age of seventeen (in 1856) William King entered the service of the Liverpool Gas Company under the tutelage of his father, and upon the death of his father in 1867, he succeeded him as engineer-in-chief of that company, which position he held with great distinction until his retirement, due to age limit, in 1904. As Mr. King himself often remarked, a service of seventy-eight years in one company by father and son is perhaps unique in the history of gas lighting.

After retirement from executive control, Mr. King still continued his interest in his profession, and at the time of his death was a director of the Brentford Gas Company, the largest of the London suburban companies. He was a member of the Institution of Civil Engineers, as was his father before him, and earnest in his support of the high traditions of that great institution. He was also a member of the Institution of Mechanical Engineers and an associate of the Surveyors' Institution. He was, of course, an influential member of the principal institutions connected with the gas industry, which he also served as a member of the departmental committee of the Board of Trade (of which Lord Rayleigh was chairman), on the "Quality and Purity of the Gas Supply of London and Methods of Gas Testing."

Mr. King first visited the United States in 1877, and later in 1892 for the especial purpose of investigating the manufacture and distribution of carbureted water gas. Upon his return he erected complete new works for the Liverpool Gas Company at Garston for the exclusive manufacture of carburetted water gas.

Although Mr. King's professional and administrative qualifications were of the highest order, he was no less distinguished in his more personal characteristics. The most honorable of men, uncompromising honesty was his first requirement. He was a staunch conservative, and to casual observation might sometimes have appeared to be leaning backward, but results invariably justified his prudence. His interests were remarkably wide and his perception in all directions wonderfully keen—almost instantaneous. Delightful as a companion, his vidid personality never permitted a dull moment. He was a sincere churchman, and to the end followed the reading of the Scriptures in his Greek Testament. He was a Justice of the Peace for Lancashire. He had no children, but he and his wife, who survives him, were inseparable companions even in his travels which were far and wide. Their home at Waterloo was noted for its refined hospitality. He had been a yachtsman in earlier days, and was always happy at sea. Apart from his work, it may be said that traveling was his chief occupation and delight, and so keen was his penetrating observation that few travelers have ever utilized their opportunities to greater advantage. Just, true and warmhearted, William King was a thorough aristocrat, in the best sense of the term. Whoever had the honor of his friendship, will cherish the memory as a rich and rare possession.

C. N. Nettleton,
W. B. Bradley,
(Signed) Alex C. Humphreys,
Chairman,
Committee.

Presented Feb. 8, 1917.

Bellefontaine, O., Plant Run at Loss

High prices continuing, the gas and electric light plants of the city will be operated at a loss, figuring the receipts at the present rates. The gas and electric funds are already overdrawn as a result of the high cost of materials and supplies at each plant. What the outcome will be is undecided by city officials. Here are the figures for the gas plant:

Estimated expenses, less contingent, $31,730.

Estimated collections, present rate, $23,730.

Estimated collections, no discount, $25,500.

Rochester Employees Taking Advantage of N. C. G. A.'s Courses

Twenty employees of the Rochester Railway & Light Company are taking the correspondence course offered by the National Commercial Gas Association. The class meets at the lighting company's offices every Monday evening at 8 o'clock, two of its members acting as instructors. Eight men are coming up from Canandaigua to work with the local class.

Permission Granted to Lay Main Across National Road

The county commissioners at their session in Bellaire, O., granted the East Ohio Gas Company permission to lay a 20-inch gas line across the National road at the Great Western, with the understanding that they were to replace the filler and brick as good as it was before.

New Orleans Commission Proposes Reduction

A set of recommendations proposing a lowering of twenty cents per thousand cubic feet in the price of gas, that testmeters be installed free on request, and that gas must have a heating capacity of 600 British thermal units, were adopted at the meeting of the public utilities commission of New Orleans, La., and were referred to the New Orleans Railways & Light Company for consideration.

The proposals were adopted on a report by Dr. V. K. Irion, who has made a study of the subject during the past two weeks. After they come back from the railways company, the resolutions will be drafted into an ordinance and presented to the commission council.

The present rate for gas is $1.10 per thousand cubic feet with ten cents discounts for prompt payment. The utilities commission would make the rate ninety cents with the ten cents discount.

Beehive Shipments Decrease

The decrease in shipments of bituminous coal in December, 1916, compared with November, 1916, was 1.2 per cent., and compared with December, 1915, was 9.2 per cent. The average number of cars of coal per working day was 19,526 in December, 1916, against 20,596 in November, 1916, and 20,679 cars in December, 1915. The 56 roads contributing to this total originated approximately 65 per cent. of the total shipments of bituminous coal on railroads in 1915.

The following statement of carloads of bituminous coal that originated on 56 railroads and of beehive coke on 11 roads in December, 1916, is compiled from reports received by the U. S. Geological Survey, by noon Jan. 15, 1917:

Comparative Figures Based on Reports for December, 1916

	Dec., 1916.	*Nov.*, 1916.	*Dec.*, 1915.
Carloads of bituminous coal (56 roads)..	488,156	494,312	537,647
Carloads of beehive coke (11 roads)....	61,880	66,619	67,480

Societies' and Associations

Illinois Gas Association will hold the thirteenth annual convention in Chicago, March 21 and 22, 1917. Headquarters will be at the Hotel Sherman, and the banquet will be held there, Thursday evening, March 22. The following papers are being prepared, which will make this meeting of great interest to all connected with the gas industry:

"Engineering Work in Connection with Rate Cases," by A. S. B. Little.

"A Study of Domestic Gas Ovens," by W. C. Buttner.

"Industrial Gas," by F. F. Cauley.

"Welding Steel Mains," by E. E. Lungren.

"Use of Illinois Coal in Making Coal Gas," by E. H. Taylor.

"Combination Gas and Coal Ranges: "Is it Desirable, or a Step Backward, to Push Their Sale?" by H. L. Dunavan.

"The Relations of the Bureau of Standards to the Gas Industry," by R. S. McBride.

"Methods of Keeping Construction Data to Assist in Appraisal Work," by Paul Bird.

"Fundamental Features of a Sound Public Utility Bond," by F. K. Shrader.

"Service Rendered by the Gas Companies of this State," by S. P. Farwell.

"Rates," by J. M. Spitzglass.

Any member who is particularly interested in the papers may obtain advance copies on application to the secretary.

Horace H. Clark,
Secretary.

Pennsylvania Gas Association will hold its ninth annual meeting at Reading, Pa., April 11, 12, 13, 1917. A comprehensive list of papers is being prepared covering *manufacturing, distribution* and *selling*. In addition to the list of papers, a lecture has been arranged (the topic and speaker to be announced later) by an official connected with the U. S. Government on a subject of great moment to the gas industry.

The Southern Gas Association will hold its ninth annual meeting at Roanoke, Va., May 2, 3, 4, 1917. List of papers to be presented:

"Relations Existing Between a Public Service Corporation and a Community," by A. B. Paterson, Meridian, Miss.

"Selling Campaigns," by George Sligo, Atlanta, Ga.

"Gas Heating," by H. D. O'Brien, Savannah, Ga.

"Philosophy of Costs," by R. L. Ellis, Selma, Ala.

"Distribution Service," by F. L. Marshall, Augusta, Ga.

"Accounting," by E. C. Stothart, Charleston, S. C.

"Modern Gas Lighting," by H. H. Dunn, Roanoke, Va.

"Gas for Industrial Purposes," by L. Gaston, Knoxville, Tenn.

"Advertising," by Thos. R. Elcock, Jr., Philadelphia, Pa.

THE NEW ENGLAND ASSOCIATION OF GAS ENGINEERS will hold their forty-seventh annual meeting at the Copley Plaza Hotel, Boston, Mass., Feb. 14, 15, 1917.

THE WESTERN STATES GAS & ELECTRIC COMPANY of California has called for redemption on April 1 the entire outstanding issue of three-year 6 per cent. coupon notes, dated Oct. 1, 1914, and amounting to $621,500. The bonds are called at 100½, payable April 1, 1917, when interest will cease.

THE BLACKSTONE VALLEY GAS & ELECTRIC COMPANY, Pawtucket, increased its capital stock from $4,000,000 to $8,000,000.

THE LACLEDE GAS LIGHT COMPANY of St. Louis 5-per cent. debentures due Feb. 1, 1919, have been sold by Halsey, Stuart & Co., Chicago, and G. H. Walker & Co., St. Louis.

THE PENNSYLVANIA GAS COMPANY elected the following officers at their regular annual meeting recently: President, Raymond Cross; vice-presidents, J. F. Jefferson, L. L. Graham; secretary and treasurer, H. H. McConnell; assistant secretary and treasurer, J. W. Kitchen; comptroller, W. J. Judge; land and tax agent, L. L. Graham.

THE GRAND RAPIDS GAS LIGHT COMPANY elected the following officers at their annual meeting held Jan. 26, 1917: President, Emerson McMillin, New York; first vice-president, John T. Young; second vice-president, Alanson P. Lathrop, New York; secretary, Glenn R. Chamberlain; treasurer, John A. Hulswit; assistant secretary and treasurer, C. N. Jelliffe; chairman of the board, J. Boyd Pantlind. The directors as elected are: Emerson McMillin, Alanson P. Lathrop, Thomas J. O'Brien, Lewis H. Withey, William H. Anderson, Henry Idema, Henry Sullivan, J. Boyd Pantlind and John T. Young.

THE ILLUMINATING ENGINEERING SOCIETY held the monthly meeting of the New England section at Chipman Hall, Boston, Mass., Feb. 16, 1917. S. Carlton Rogers gave an interesting address on "Present Practice in Automobile Head Lighting."

THE PITTSBURGH SECTION of the AMERICAN GAS INSTITUTE OF ELECTRICAL ENGINEERS and the ILLUMINATING ENGINEERING SOCIETY held a joint meeting in the auditorium of the Oliver Building, Pittsburgh, Pa., Feb. 13, 1917. W. E. Reed, consulting engineer presented a paper on street lighting specifications, which was followed by several interesting discussions.

THE WISCONSIN GAS ASSOCIATION has recently changed the dates of their convention to March 13, 14 and 15, instead of 14, 15 and 16, as they had previously announced. This change was made due to an interference of a meeting by the public utilities commission of Wisconsin upon the same dates.

THE GAS EMPLOYEES ASSOCIATION of the Pittsfield Coal Gas Company held their fourth annual meeting at the rooms of the association in the Gas Building, at 30 South Street, Pittsfield, Mass. Nearly 60 members were present, the retiring president Ralph Volin presiding. The election of officers for the ensuing year was part of the business attended to, with the following results: President, William Gleiner; vice-president, James Murphy; secretary, John J. Quinn; treasurer, Rudolph Ilian. Several entertainment features and a banquet served by a special committee made the evening enjoyable for all present.

THE FLATBUSH GAS COMPANY'S EMPLOYEES ASSOCIATION gave their annual dinner at Oetjens Banquet Hall, Feb. 1. There were about 300 members and guests present, and all enjoyed the new songs, and cabaret and vaudeville performance.

Personal Notes

THE HAVRE NATURAL GAS COMPANY of Havre, Mont., held the annual meeting of the shareholders Jan 23, and the following directors were elected for the coming year: D. S. McKenzie, H. O. Wheeler, A. L. Ritt, Charles A. Rose, E. M. Kennedy, C. W. Young, Charles Boles, E. T. Broadwater and W. H. Wheeler. The election of officers for the year will be held at a later date.

THE LUDINGTON (Mich.) GAS COMPANY held its annual meeting recently, and the following officers and directors were elected: President, Charles N. Remington; vice-president, Andy Fyfe; secretary, Charles A. Coye; treasurer, Henry L. Adsit. These officers and Oscar D. Wilmarth constitute the board of directors.

HANS J. GERLICH, manager of the sales department of the Flatbush Gas Company was presented with a gold watch by the employees in recognition of Mr. Gerlich's five years' service with the company.

LEE BENOIST was recently elected president of the New Orleans Gas Company of New Orleans, La., at a reorganization meeting held when the gas company was placed under separate management from the New Orleans Railway & Light Company.

NATHANIAL J. RUST, previously president of the Dorchester Gas Light Company, died at his home 488 Commonwealth Avenue, Boston, Feb. 5, 1917. He was 88 years old, and one of the most well-known executives in Boston.

GEORGE L. WILKINS, sales manager for the Sheboygan (Wis.) Gas Light Company, has been appointed to a similar position at Green Bay. Charles Pepper, who has been in charge of the distributing department for many years, will succeed Mr. Wilkins.

Construction Notes

Rebuilding Benches at Atlanta Plant

Six entire coal-gas benches are being rebuilt, of the eleven at the gas plant of the Atlanta (Ga.) Gas Light Company. The work already has resulted in the completion of one of the number, and two others are nearly ready. New retorts of silica blocks fitting tightly together, are being put in. This work was planned to begin last April, but long delay in delivery of the first material delayed its start till the first of 1917. The job probably will be finished before March 1. Its completion will relieve somewhat the shortage of coke, the works having been unable to supply the whole retail demand for the latter by-product through some weeks past.

New By-Product Coke Plant Under Construction in Southern Ohio

The Ironton-Solvay Coke Company, Ironton, Ohio, has been incorporated with $2,000,000. capital stock by Frank R Rhodes, Cincinnati; R. B. Parker, Syracuse, N. Y.; Nelson Weedon, Ironton, and others, to operate a coke plant with an initial capacity of 900 tons per day. A site of about 50 acres has been secured within the city limits of Ironton and work has already commenced on the foundations of the plant. Semet-Solvay ovens will be installed and it is hoped to have the plant in full operation within the next six months. Frank R. Rhodes is a member of the pig-iron and coke firm of Eaton, Rhodes & Co., Cincinnati.

Turbine and Exhauster to Supply Pressure

The medium pressure gas service at Decatur, Ga., will be supplied by a De-Laval steam turbine with a Connellsville exhauster as auxiliary, as soon as those improvements can be installed at the gas works of the Atlanta Gas Light Company. They will replace the fan exhausters now used for this purpose.

Battery of 44 By-Product Coke Ovens Completed

The Inland Steel Company, Indian Harbor, Ind., has just placed in operation a battery of 44 Koppers by-product coke ovens. This completes the third order given by the Inland Company to the H. Koppers Company for coke ovens. The plant now consists of 130 Koppers' ovens with complete by-product and benzol recovery plants.

The H. Koppers Company has completed 805 by-product coke ovens in the past 12 months. These ovens have a total coal carbonizing capacity of approximately 5,000,000 net tons of coal per year.

Tar Plant to Be Rebuilt at Atlanta, Ga.

In order to relieve somewhat the congestion at the gas works to make room for the rebuilding of the tar plant there, R. C. Congdon, manager of the Atlanta Gas Light Company, Atlanta, Ga., states the service pipe store-shed and the coating plant will be moved to the premises of the Davis Street steam plant of the power company. One new 8,000-gallon still will be put in at the gas works, this doing away with the two vertical stills, one of which was the source of the recent fire. A fire-wall will be built to shut the still off from other portions of the plant.

Gas for College Park, Ga., to Be Ready Soon

Approximately nineteen miles of the twenty-two miles of high pressure gas mains planned to serve East Point, College Park, Ga., and intermediate communities, have been laid, according to C. J. Weinmeister, superintendent of mains of the Atlanta Gas Light Company and if bad weather does not interfere, the whole equipment will be ready by March 31. Mr. Weinmeister reports the company's main-laying forces as having just now crossed Park Street, on Ashby, on their way to the gas works.

This new and important service will be supplied through four-inch steel pipe, every joint of which is welded, the entire system being made thus into one whole piece. Some seven miles of welded mains have been laid in each of the two municipalities of South Fulton.

Probably about the middle of March the company will be ready to receive service orders. The new compressor ordered for this system is practically ready at the gas works, and as soon as the intervening three miles of line are laid gas can be turned on in College and East Point.

Coal Handling Equipment Installed by Three Companies

New rigging for the conveyance of coal from barges to storage places has been installed within the last few weeks by the Bridgeport Gas Light Company, American Tube & Stamping Company, the Ira Gregory & Sons Coal Company, and the American Brass Company. The tube and stamping company's and the gas company's places are at Black Rock, Conn., while the American Brass Company's coal storage plant is on the Housatonic River at Devon, Conn.

The buckets used in conveyance of coal at the hot mills of the tube and stamping company and the brass company are some of the largest ever used. Each bucket carries a ton and a half of material, while those installed by the other firms convey about a ton. The boom on the rigging of the brass company is 110 feet in length. The work of lightering coal barges in waters about Bridgeport is greatly accelerated by the new equipment.

New Plant Proposed at Bellefontaine

W. C. McCracken, of Ohio State University, was recently in Bellefontaine, Ohio, in conference with the Service Director regarding the gas plant. Mr. McCracken may be engaged to submit specifications for the proposed new gas plant.

Cleveland Getting Gas Through New Main

East Ohio Gas Company officials announced that the first section of their new main from the West Virginia gas fields has been connected up and Cleveland got its first gas through the new main Feb. 2.

"We are not forcing the new main very hard, but Cleveland is getting about 3,000,000 cubic feet of gas through it," said company officers. "If nothing happens a larger supply of gas will come through the main soon."

The effect of the additional gas on the city's gas pressure was evident. The lowest pressure recorded at the city hall was 3.9 ounces.

First Section of Texas Holder Filled

The first section of the San Antonio Gas & Electric Company's new gas holder, being built near the I. & G. N. depot, in San Antonio, Tex., has been completed and was filled with 500,000 cubic feet of gas recently. When entirely completed the holder will have a capacity of 2,000,000 cubic feet.

According to Vice-President W. B. Tuttle of the company, work is being rushed ahead with all possible speed as the increasing demand for gas experienced here is making the added capacity to supply it.

With the big tanks that the gas and electric company already has, the new holders will give the city probably the largest store of artificial gas of any other city in the state.

Barrington to Get Gas from Providence

The Providence (R. I.) Gas Company has obtained permission from the Barrington Town Council to lay gas mains from the end of its present pipes at Riverside to Kelley's bridge at the Warren town line, a distance of six miles.

Coincident with the request that the company be allowed to make the necessary extension Vice-President Charles H. Manchester announced that the gas company had entered into a 10-year contract to supply the Bristol County Gas & Electric Company with gas at wholesale. The entire capital stock of this company is held by the Narragansett Electric Lighting Company.

Work on laying the mains, which will be under the state roads in the town, will be begun some time in April, Mr. Manchester told the council. The roads committee of the Barrington Town Council will supervise the operations.

With the placing in operation of the new lines the Warren and Bristol gas manufacturing plants will probably cease to be operated, according to Mr. Manchester. The towns use about 40,000,000 cu. ft. of illuminating gas. It is estimated that the citizens of Barrington will use less than 10,000,000 cu. ft. The town has never had a gas supply.

The contract between the two companies has been filed with the public utilities commission. Officials of the Providence Gas Company say that the price which they are to receive for their product is not a fixed one, but is on sliding scale "dependent on conditions."

Two Million Foot Holder Planned for New Brunswick, N. J.

Application was made at the meeting of the City Commission of New Brunswick, N. J., by the Public Service Gas Company for a permit to erect a steel gas holder on its property, at Washington and Water streets; the capacity of which shall be two million cubic feet of gas.

The proposed gas holder would be 144 feet in diameter and about 175 feet in height, the estimated cost being $168,000, beside $5,000 for the foundation. The petition was referred to Commissioner Houghton.

New Lights Near Gasometers in Massachusetts Plant

The Malden & Melrose Gas Light Company, as a precautionary measure, has installed 40 new gas lamps about the gasometers of its plant in Pleasant and Commercial Streets, Malden, Mass. The plant is one of the largest in the metropolitan district, and supplies Malden and several of the adjoining cities and towns with gas.

Report of Louisville, Ky. Company Shows Heavy Increase

The gas department of the Louisville Gas & Electric Company of Louisville, Ky., reports that contracts were taken for 45 gas-heating appliance installations during the week ending Feb. 3. It also shows that the gas output was 46.5 per cent. greater than for the corresponding week of 1916.

Oklahoma Gas Contract

Contract for supplying natural gas for the boilers of the American Ice & Oil Company, at Oklahoma City, Okla., has been secured by the new business department of the Oklahoma Gas & Electric Company. A wholesale produce house will erect a new building, the basement and first floor of which will be used for cold storage. The refrigerating plant will require about 150 horse-power in motors for operation.